SCHISCHEK
EXPLOSIONPROOF

Schischek Explosionproof.

Protection of Life. Health. Assets.

Technical
Short information
2012

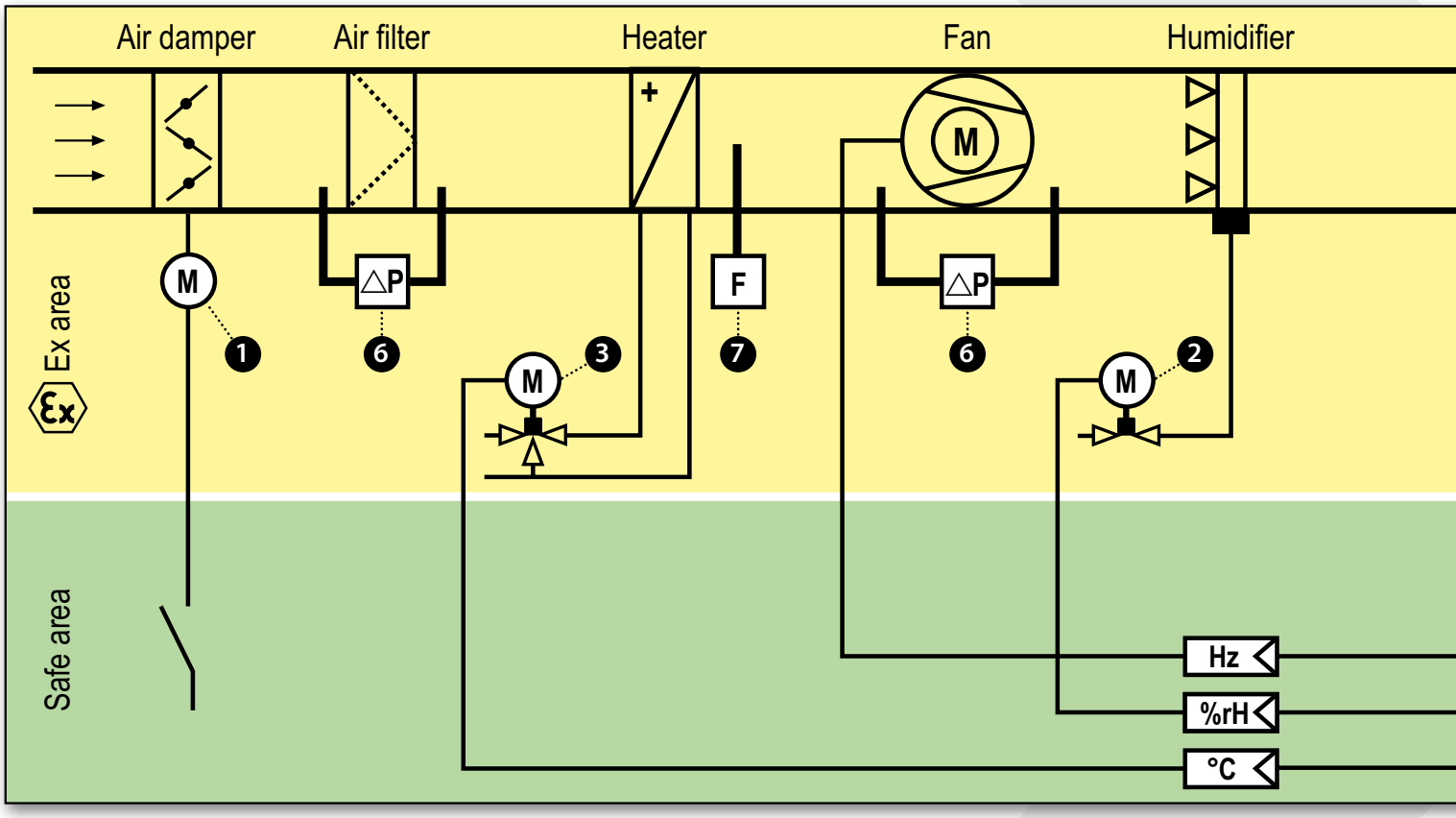
Which components have to be explosion proof?

In the diagram below, a typical air-handling system shows which equipment is allowed in the Ex area and which should only be placed in the safe area. The diagram does not claim to be complete.

If in doubt, please do not hesitate to consult us at Schischek. We will advise you in any case. A brief discussion in the early stages of planning can avoid substantial costs in remedial work later and gives you the peace of mind that you have a safely installed operating system.

You should be aware of the areas of installation where an explosive atmosphere may build up. Furthermore, you should have the responsible authority classify the relevant Ex zone and in combination with type and condition of the explosive medium, you should be able to select suitable explosion proof equipment.

With Schischek products this is simple because all equipment is certified according to the highest safety standards – according to ATEX, of course!



1 Quarter turn actuators for air/fire dampers

Type
ExMax
RedMax

- 5…150 Nm
- 3...150 sec/90°
- On-off, 3-pos
- modulating
- with/without spring return

2 Valve actuators w. spring return for humidifying

Type
LIN-..+ExMax..
LIN-..+RedMax..

- 500…3.000 N
- 10…42 mm stroke
- 0,1...15 sec/mm
- On-off, 3-pos
- modulating
- with spring return

3 Valve actuators for heating, cooling

Type
ExRun
RedRun

- 500…10.000 N
- 5…60 mm stroke
- 2...15 sec/mm
- On-off, 3-pos
- modulating

4 Temperature and humidity sensors

Type
ExCos-D
RedCos-D

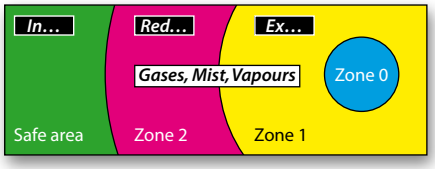
- -40°C…+125°C
- 0…100 %rH
- full range adjustable

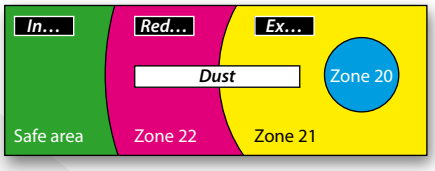
Schischek colour coding and zones according to ATEX/94/9/EC

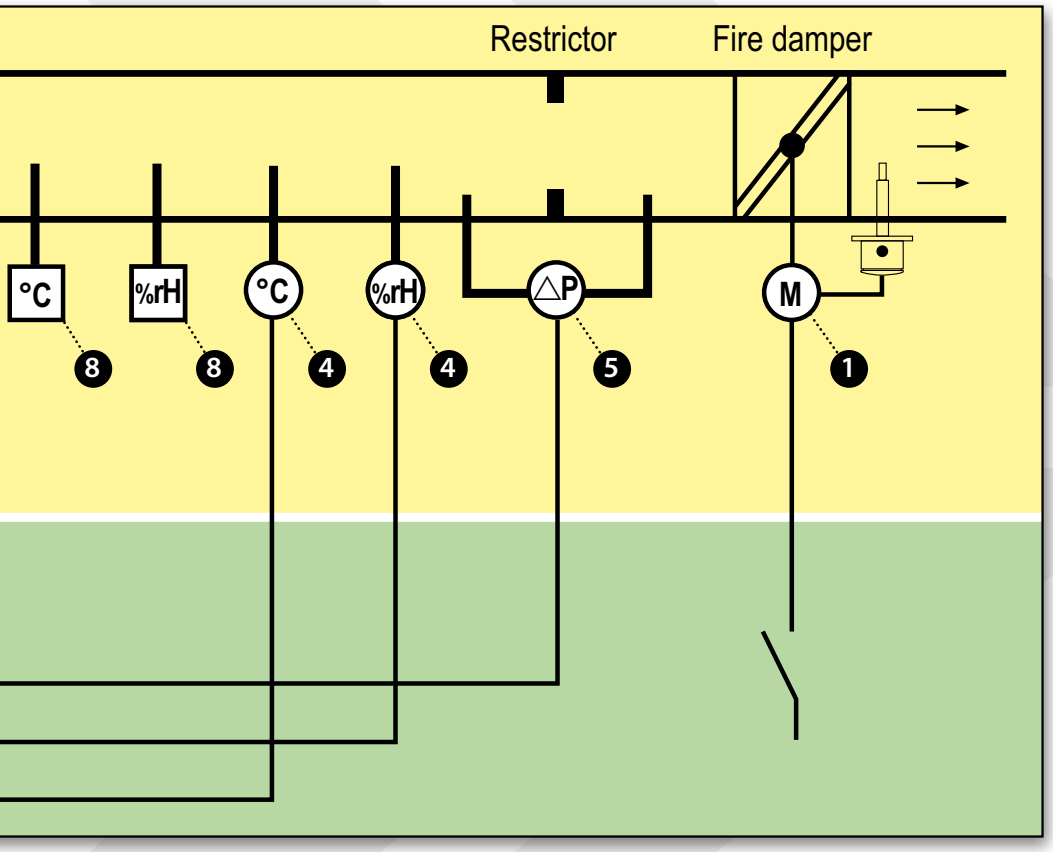
Ex... *modules for zone 1, 2, 21, 22*

Red... *modules for zone 2, 22*

In... *modules for use in safe area*



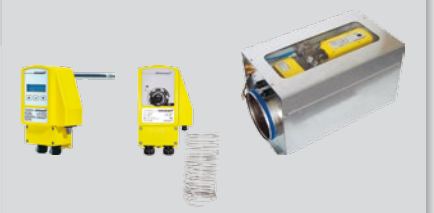




Actuators for air technology

Actuators for liquids

Measurement and control



5 Pressure/differential pressure sensors

Type
ExCos-P
RedCos-P

- ± 100 Pa up to...
- ± 7.500 Pa
- full range adjustable

6 Filter monitoring, fan belt protection

Type
ExBin-P
RedBin-P

- 0...500 Pa
- 0...5.000 Pa
- Pressure/Differential pressure
- Fan-belt protection
- Filter protection
- 1- or 2-stage switching point

7 Frost protection for air technology

Type
ExBin-FR
RedBin-FR

- -10°C...+15°C
- Capillary: 3 m, 6 m
- 1-stage switching point

8 Thermostats, humidistats

Type
ExBin-D
RedBin-D

- -40°C...+125°C
- 0...100 %rH
- 1- or 2-stage switching point

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*SA = Safe area
(●) = on request

Electrical drive engineering with 90° angle of rotation

Overview ..Max quarter turn actuators

The actuator series are subdivided in 3 installation- and 3 application-areas.

Installation-areas:

ExMax- ..... actuators for use in hazardous areas zone 1, 2, 21, 22
RedMax- ..... actuators for use in hazardous areas zone 2, 22
InMax- ..... actuators for use in safe area

Application-areas:

Ex / Red / InMax ..... for air and fire dampers, VAV, ball valves, control dampers

The actuator concept offers obvious advantages:

1. Small dimension, compact, easy installation, highest protection classes, cost effective
2. Universal power supply 24 to 240 Volt AC/DC, selfadjustable
3. With or without spring return (in acc. with type)
4. Robust aluminium housing, IP66
5. Integrated heater for low temperatures
6. On site adjustable motor running time
7. Integrated manual override
8. Useful accessories such as retrofit limit switches
9. Actuators are direct coupling

Nm **ExMax..**

95°

Actuators for air-dampers

ExMax.., RedMax.., InMax.. ¼ turn actuators

90° actuators from 5 to 150 Nm, with or w/o spring return (running time 1, 3, 10, 20 s depending on type), for air-dampers.

Nm **ExMax..**

95°

Actuators for smoke- and fire-dampers

ExMax.., RedMax.., InMax.. ¼ turn actuators

90° actuators from 5 to 150 Nm, with or w/o spring return (running time 1, 3, 10, 20 s depending on type), for smoke- and fire-dampers.

Nm **ExMax..**

95°

Actuators for VAV control

ExMax.., RedMax.., InMax.. ¼ turn actuators

90° actuators from 5 to 150 Nm, with or w/o spring return (running time 1, 3, 10, 20 s depending on type), for VAV control.

Nm **ExMax..**

95°

Actuators for ball valves

ExMax.., RedMax.., InMax.. ¼ turn actuators

90° actuators from 5 to 150 Nm, with or w/o spring return (running time 1, 3, 10, 20 s depending on type), for ball valves.

Nm **ExMax..**

95°

Actuators for butterfly valves and other ¼ turn valves

ExMax.., RedMax.., InMax.. ¼ turn actuators

90° actuators from 5 to 150 Nm, with or w/o spring return (running time 1, 3, 10, 20 s depending on type), for butterfly valves and other quarter turn valves.

Safe area | **Ex area**

ExMax 90° Ex quarter turn actuators size „S“ for zone 1, 2, 21, 22

Explosion proof

Features of ExMax - ... size „S“

ExMax-...	Size „S“	Description	Basics for all ExMax-.. size „S“
Explosion proof zone 1, 2, 21, 22 gas + dust PTB-certified II 2(1) G Ex d [ia] IIC T6 II 2(1) D Ex tD [iaD] A21 IP66 T80 °C ATEX 94/9/EC IECEx		ExMax are, in acc. with type, for automation of air dampers, fire and smoke dampers, volume control, as well as for ball valves, throttle valves and other quarter turn armatures. **Delivery:** 1 actuator, ~ 1 m cable, allen key for manual override, 4 screws.	• **24…240 VAC/DC** self adaptable power supply • Up to 5 different running times adjustable on site • 95°angle of rotation (5° for pretension) • 100% overload protected • Aluminium housing IP66, cable ~ 1 m • -40...+40°C/+50°C, integrated heater • Emergency manual override • Squared shaft connection 12 × 12 mm • Dimensions (H × W × D) 210 × 95 × 80 mm

Ex-d quarter turn actuators without spring return, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
ExMax- 5.10	5 Nm / 10 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	-	-	S
ExMax-15.30	15 Nm / 30 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	-	-	S
ExMax- 5.10-S	5 Nm / 10 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
ExMax-15.30-S	15 Nm / 30 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
ExMax- 5.10-Y	5 Nm / 10 Nm	7,5/15/30/60/120 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
ExMax-15.30-Y	15 Nm / 30 Nm	7,5/15/30/60/120 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S

Ex-d quarter turn actuators with spring return, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
ExMax-5.10-F	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	-	-	S
ExMax- 15-F	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	-	-	S
ExMax-5.10-SF	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
ExMax- 15-SF	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
ExMax-5.10-YF	5 Nm / 10 Nm	7,5/15/30/60/120 sec.	~ 3 sec. / 10 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
ExMax- 15-YF	15 Nm	7,5/15/30/60/120 sec.	~ 3 sec. / 10 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
ExMax-5.10-BF	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	S
ExMax- 15-BF	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	S

Ex-d quarter turn actuators with 1 sec. spring return for Offshore application, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
ExMax- 8-F1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	-	-	S
ExMax-15-F1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	-	-	S
ExMax- 8-SF1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	-	S
ExMax-15-SF1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	-	S
ExMax- 8-BF1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	S
ExMax-15-BF1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	S

Accessories and special designs (additional price)

Type	Technical data
ExMax-...VAS	Size „S“, housing material in stainless steel AISI 316, some parts nickel plated
ExMax-...CTS	Size „S“, aluminium housing Amercoat painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
ExSwitch	External, adaptable, on site adjustable Ex-d auxilliary switch with 2 potential free contacts, adaptable to ExMax-... actuators
ExSwitch-CT	Ex-d auxilliary switch, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
ExBox-3P	Ex-e terminal box connectable to ExMax-... actuators with 1 cable for On-off or 3-pos operation
ExBox-3P/SW	Ex-e terminal box connectable to ExMax-... actuators with 1 cable for On-off or 3-pos operation + 2 cable for external aux. switches type ExSwitch
ExBox-Y/S	Ex-e terminal box connectable to ExMax-... actuators with 2 cable, for modulating operation or 3-pos + integrated switches (HS)
ExBox-Y/S/SW	Ex-e terminal box connectable to ExMax-... actuators with 2 cable, for modulating or 3-pos operation with feedback signal + 2 cable for external aux. switches
ExBox-BF	Ex-e terminal box connectable to ExMax-... actuators with 1 cable, for all ExMax-...-BF
ExBox-BF/SW	Ex-e terminal box connectable to ExMax-... actuators with 1 cable, for all ExMax-...-BF + 2 cable for external aux. switches type ExSwitch
ExBox-.../VA	Ex-e terminal-box, housing made of stainless-steel type AISI 316 L, some parts nickel plated, surcharge on aluminium version
ExBox-.../CT	Ex-e terminal-box, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
MKK-S	Mounting bracket for …Box-terminal boxes for direct coupling to …Max... actuators size „S“
MKK-S/VA	Mounting bracket, made of stainless-steel suitable for ExBox...VA
KB-S	Mounting clamp for round damper shaft Ø 10 to 20 mm and squared shafts 10 to 16 mm, incl. bracket, connectable to all ExMax-... size „S“
HV-SK, HV-SL	Manual override, connectable to actuators size „S“. HV-SK = short version, HV-SL = long version for add. mounting of ..Box/..Switch (not suitable for ..Max-..-..F1!)
AR-12-xx	Squared reduction part from 12 × 12 mm to shafts with 11 mm (type AR-12-11), 10 mm (type AR-12-10), 8 mm (type AR-12-08)
D-F-...S	Adaptation with flange acc. to DIN EN 5211 for butterfly or ball-valves suitable for size „S“
ExPro-TT-...	Safety temperature limiter for fire dampers, switching at 71°/72°C, with 1 m cable, suitable only for ExMax-/RedMax-...-BF actuators!
Retrofit-Kit ..Max-S	Mechanical adaptation for mounting on ..Max actuators size „S“, required to replace a previous type EXT15..-F1, EXT12..-F16, EXT15.. or EXT30..

ExMax 90° Ex quarter turn actuators size „M“ for zone 1, 2, 21, 22

Explosion proof

ExMax-...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II 2(1) G Ex d [ia] IIC T6
II 2(1) D Ex tD [iaD] A21 IP66 T80 °C
ATEX 94/9/EC
IECEx

Size „M“

Features of ExMax - ... size „M“

Description

ExMax are, in acc. with type, for automation of air dampers, fire and smoke dampers, volume control, as well as for ball valves, throttle valves and other quarter turn armatures.

Delivery:
1 actuator, ~ 1 m cable, allen key for manual override, 4 screws.

Basics for all ExMax-.. size „M“

- **24…240 VAC/DC** self adaptable power supply
- Up to 5 different running times adjustable on site
- 95°angle of rotation (5° for pretension)
- 100% overload protected
- Aluminium housing IP66, cable ~ 1 m
- -40...+40°C/+50°C, integrated heater
- Emergency manual override
- Squared shaft connection 16 × 16 mm
- Dimensions (H × W × D) 287 × 149 × 116 mm

Ex-d quarter turn actuators without spring return, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
ExMax-50.75	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	-	-	M
ExMax- 100	100 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	-	-	M
NEW ExMax- 150	150 Nm	40/60/90/120 sec.	-	On-off, 3-pos	-	-	M
ExMax-50.75-S	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
ExMax- 100-S	100 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
NEW ExMax- 150-S	150 Nm	40/60/90/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
ExMax-50.75-Y	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
ExMax- 100-Y	100 Nm	40/60/90/120/150 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M

Ex-d quarter turn actuators with spring return, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
ExMax-30-F	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
ExMax-50-F	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
NEW ExMax-60-F	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
ExMax-30-SF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
ExMax-50-SF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
NEW ExMax-60-SF	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
ExMax-30-YF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
ExMax-50-YF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
ExMax-30-BF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M
ExMax-50-BF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M
NEW ExMax-60-BF	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M

Ex-d quarter turn actuators with 3 sec. spring return for Offshore application, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
ExMax-30-F3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	-	-	M
ExMax-50-F3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	-	-	M
ExMax-30-SF3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	-	M
ExMax-50-SF3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	-	M
ExMax-30-BF3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M
ExMax-50-BF3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M

Accessories and special designs (additional price)

Type	Technical data
ExMax-...-CTM	Size „M“, aluminium housing Amercoat painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
ExSwitch	External, adaptable, on site adjustable Ex-d auxilliary switch with 2 potential free contacts, adaptable to ExMax-... actuators
ExSwitch-CT	Ex-d auxilliary switch, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
ExBox-3P	Ex-e terminal box connectable to ExMax-... actuators with 1 cable for On-off or 3-pos operation
ExBox-3P/SW	Ex-e terminal box connectable to ExMax-... actuators with 1 cable for On-off or 3-pos operation + 2 cable for external aux. switches type ExSwitch
ExBox-Y/S	Ex-e terminal box connectable to ExMax-... actuators with 2 cable, for modulating operation or 3-pos + integrated switches (HS)
ExBox-Y/S/SW	Ex-e terminal box connectable to ExMax-... actuators with 2 cable, for modulating or 3-pos operation with feedback signal + 2 cable for external aux. switches
ExBox-BF	Ex-e terminal box connectable to ExMax-... actuators with 1 cable, for all ExMax-...-BF
ExBox-BF/SW	Ex-e terminal box connectable to ExMax-... actuators with 1 cable, for all ExMax-...-BF + 2 cable for external aux. switches type ExSwitch
ExBox-.../CT	Ex-e terminal-box, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
MKK-M	Mounting bracket for …Box-terminal boxes for direct coupling to …Max... actuators size „M“
HV-MK	Manual override, connectable to actuators size „M“ (not suitable for ..Max-..-..F3!)
AR-16-xx	Squared reduction part from 16 × 16 mm to shafts with 14 mm (type AR-16-14), 12 mm (type AR-16-12)
D-F-...M	Adaptation with flange acc. to DIN EN 5211 for butterfly or ball-valves suitable for size „M“
ExPro-TT-...	Safety temperature limiter for fire dampers, switching at 71°/72°C, with 1 m cable, suitable only for ExMax-/RedMax-...-BF actuators!
Retrofit-Kit ..Max-M	Mechanical adaptation for mounting on ..Max actuators size „M“, required to replace a previous type EXT30..-F3, EXT50..-F3 or EXT50..

RedMax 90° Ex quarter turn actuators „S“ for zone 2, 22

Explosion proof

RedMax-...	Size „S“
Explosion proof zone 2, 22 gas + dust PTB-certified II 3(1) G Ex nC [ia] IIC T6 II 3 G Ex nC II T6 II 3 D Ex tD A22 IP66 T80 °C ATEX 94/9/EC IECEx	

Features of RedMax - ... size „S“

Description

RedMax are, in acc. with type, for automation of air dampers, fire and smoke dampers, volume control, as well as for ball valves, throttle valves and other quarter turn armatures.

Delivery:
1 actuator, ~ 1 m cable, allen key for manual override, 4 screws.

Basics for all RedMax-.. size „S“

- **24…240 VAC/DC** self adaptable power supply
- Up to 5 different running times adjustable on site
- 95°angle of rotation (5° for pretension)
- 100% overload protected
- Aluminium housing IP66, cable ~ 1 m
- -40...+40°C/+50°C, integrated heater
- Emergency manual override
- Squared shaft connection 12 × 12 mm
- Dimensions (H × W × D) 210 × 95 × 80 mm

Ex-n quarter turn actuators without spring return, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
RedMax- 5.10	5 Nm / 10 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	-	-	S
RedMax-15.30	15 Nm / 30 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	-	-	S
RedMax- 5.10-S	5 Nm / 10 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
RedMax-15.30-S	15 Nm / 30 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
RedMax- 5.10-Y	5 Nm / 10 Nm	7,5/15/30/60/120 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
RedMax-15.30-Y	15 Nm / 30 Nm	7,5/15/30/60/120 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S

Ex-n quarter turn actuators with spring return, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
RedMax-5.10-F	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	-	-	S
RedMax- 15-F	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	-	-	S
RedMax-5.10-SF	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
RedMax- 15-SF	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
RedMax-5.10-YF	5 Nm / 10 Nm	7,5/15/30/60/120 sec.	~ 3 sec. / 10 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
RedMax- 15-YF	15 Nm	7,5/15/30/60/120 sec.	~ 3 sec. / 10 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
RedMax-5.10-BF	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	S
RedMax- 15-BF	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	S

Ex-n quarter turn actuators with 1 sec. spring return for Offshore application, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
RedMax- 8-F1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	-	-	S
RedMax-15-F1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	-	-	S
RedMax- 8-SF1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	-	S
RedMax-15-SF1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	-	S
RedMax- 8-BF1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	S
RedMax-15-BF1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	S

Accessories and special designs (additional price)

Type	Technical data
RedMax-...-VAS	Size „S“, housing material in stainless steel AISI 316, some parts nickel plated
RedMax-...-CTS	Size „S“, aluminium housing Amercoat painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
RedSwitch	External, adaptable, on site adjustable auxilliary switch with 2 potential free contacts, adaptable to RedMax-... actuators
RedSwitch-CT	Auxilliary switch, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
RedBox-3P	Ex-e terminal box connectable to RedMax-… actuators with 1 cable for On-off or 3-pos operation
RedBox-3P/SW	Ex-e terminal box connectable to RedMax-… actuators with 1 cable for On-off or 3-pos operation + 2 cable for external aux. switches type RedSwitch
RedBox-Y/S	Ex-e terminal box connectable to RedMax-… actuators with 2 cable, for modulating operation or 3-pos + integrated switches (HS)
RedBox-Y/S/SW	Ex-e terminal box connectable to RedMax-… actuators with 2 cable, for modulating or 3-pos operation with feedback signal + 2 cable for external aux. switches
RedBox-BF	Ex-e terminal box connectable to RedMax-… actuators with 1 cable, for all RedMax-…-BF
RedBox-BF/SW	Ex-e terminal box connectable to RedMax-… actuators with 1 cable, for all RedMax-…-BF + 2 cable for external aux. switches type RedSwitch
RedBox-.../CT	Ex-e terminal-box, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
MKK-S	Mounting bracket for …Box-terminal boxes for direct coupling to …Max… actuators size „S“
MKK-S/VA	Mounting bracket, made of stainless-steel suitable for …Box/VA
KB-S	Mounting clamp for round damper shaft Ø 10 to 20 mm and squared shafts 10 to 16 mm, incl. bracket, connectable to all RedMax-… size „S“
HV-SK, HV-SL	Manual override, connectable to actuators size „S“. HV-SK = short version, HV-SL = long version for add. mounting of ..Box/..Switch (not suitable for ..Max-..-..F1!)
AR-12-xx	Squared reduction part from 12 × 12 mm to shafts with 11 mm (type AR-12-11), 10 mm (type AR-12-10), 8 mm (type AR-12-08)
D-F-…S	Adaptation with flange acc. to DIN EN 5211 for butterfly or ball-valves suitable for size „S“
ExPro-TT-...	Safety temperature limiter for fire dampers, switching at 71°/72°C, with 1 m cable, suitable only for ExMax-/RedMax-…-BF actuators!
Retrofit-Kit ..Max-S	Mechanical adaptation for mounting on ..Max actuators size „S“, required to replace a previous type EXT15..-F1, EXT12..-F16, EXT15.. or EXT30..

RedMax 90° Ex quarter turn actuators „M“ for zone 2, 22

Explosion proof

RedMax-...	Size „M“
Explosion proof zone 2, 22 gas + dust PTB-certified II 3(1) G Ex nC [ia] IIC T6 II 3 G Ex nC II T6 II 3 D Ex tD A22 IP66 T80 °C ATEX 94/9/EC IECEx	

Features of RedMax - ... size „M“

Description

RedMax are, in acc. with type, for automation of air dampers, fire and smoke dampers, volume control, as well as for ball valves, throttle valves and other quarter turn armatures.

Delivery:
1 actuator, ~ 1 m cable, allen key for manual override, 4 screws.

Basics for all RedMax-.. size „M“

- **24…240 VAC/DC** self adaptable power supply
- Up to 5 different running times adjustable on site
- 95°angle of rotation (5° for pretension)
- 100% overload protected
- Aluminium housing IP66, cable ~ 1 m
- -40...+40°C/+50°C, integrated heater
- Emergency manual override
- Squared shaft connection 16 × 16 mm
- Dimensions (H × W × D) 287 × 149 × 116 mm

Ex-n quarter turn actuators without spring return, 24 to 240 VAC/DC

	Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
	RedMax-50.75	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	-	-	M
	RedMax- 100	100 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	-	-	M
NEW	RedMax- 150	150 Nm	40/60/90/120 sec.	-	On-off, 3-pos	-	-	M
	RedMax-50.75-S	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
	RedMax- 100-S	100 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
NEW	RedMax- 150-S	150 Nm	40/60/90/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
	RedMax-50.75-Y	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
	RedMax- 100-Y	100 Nm	40/60/90/120/150 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M

Ex-n quarter turn actuators with spring return, 24 to 240 VAC/DC

	Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
	RedMax-30-F	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
	RedMax-50-F	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
NEW	RedMax-60-F	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
	RedMax-30-SF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
	RedMax-50-SF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
NEW	RedMax-60-SF	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
	RedMax-30-YF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
	RedMax-50-YF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
	RedMax-30-BF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M
	RedMax-50-BF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M
NEW	RedMax-60-BF	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M

Ex-n quarter turn actuators with 3 sec. spring return for Offshore application, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
RedMax-30-F3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	-	-	M
RedMax-50-F3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	-	-	M
RedMax-30-SF3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	-	M
RedMax-50-SF3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	-	M
RedMax-30-BF3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M
RedMax-50-BF3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	ExPro-TT-.. connector	M

Accessories and special designs (additional price)

Type	Technical data
RedMax-...-CTM	Size „M“, aluminium housing Amercoat painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
RedSwitch	External, adaptable, on site adjustable auxilliary switch with 2 potential free contacts, adaptable to RedMax-... actuators
RedSwitch-CT	Auxilliary switch, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
RedBox-3P	Ex-e terminal box connectable to RedMax-… actuators with 1 cable for On-off or 3-pos operation
RedBox-3P/SW	Ex-e terminal box connectable to RedMax-… actuators with 1 cable for On-off or 3-pos operation + 2 cable for external aux. switches type RedSwitch
RedBox-Y/S	Ex-e terminal box connectable to RedMax-… actuators with 2 cable, for modulating operation or 3-pos + integrated switches (HS)
RedBox-Y/S/SW	Ex-e terminal box connectable to RedMax-… actuators with 2 cable, for modulating or 3-pos operation with feedback signal + 2 cable for external aux. switches
RedBox-BF	Ex-e terminal box connectable to RedMax-… actuators with 1 cable, for all ExMax-…-BF
RedBox-BF/SW	Ex-e terminal box connectable to RedMax-… actuators with 1 cable, for all RedMax-…-BF + 2 cable for external aux. switches type RedSwitch
RedBox-…/CT	Ex-e terminal-box, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
MKK-M	Mounting bracket for …Box-terminal boxes for direct coupling to …Max… actuators size „M“
HV-MK	Manual override, connectable to actuators size „M“ (not suitable for ..Max-..-..F3!)
AR-16-xx	Squared reduction part from 16 × 16 mm to shafts with 14 mm (type AR-16-14), 12 mm (type AR-16-12)
D-F-…M	Adaptation with flange acc. to DIN EN 5211 for butterfly or ball-valves suitable for size „M“
ExPro-TT-…	Safety temperature limiter for fire dampers, switching at 71°/72°C, with 1 m cable, suitable only for ExMax-/RedMax-…-BF actuators!
Retrofit-Kit ..Max-M	Mechanical adaptation for mounting on ..Max actuators size „M“, required to replace a previous type EXT30..-F3, EXT50..-F3 or EXT50..

InMax 90° quarter turn actuators „S“ for safe area

Industrial

InMax-…

InMax actuators are NOT Explosion proof and only for use in safe area IP66

Size „S“

Features of InMax - ... size „S“

Description

InMax are, in acc. with type, for automation of air dampers, fire and smoke dampers, volume control, as well as for ball valves, throttle valves and other quarter turn armatures.

Delivery:
1 actuator, ~ 1 m cable, allen key for manual override, 4 screws.

Basics for all InMax-.. size „S“

- **24…240 VAC/DC** self adaptable power supply
- Up to 5 different running times adjustable on site
- 95°angle of rotation (5° for pretension)
- 100% overload protected
- Aluminium housing IP66, cable ~ 1 m
- -40...+40°C/+50°C, integrated heater
- Emergency manual override
- Squared shaft connection 12 × 12 mm
- Dimensions (H × W × D) 210 × 95 × 80 mm

Quarter turn actuators without spring return, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
InMax- 5.10	5 Nm / 10 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	-	-	S
InMax-15.30	15 Nm / 30 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	-	-	S
InMax- 5.10-S	5 Nm / 10 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
InMax-15.30-S	15 Nm / 30 Nm	3/15/30/60/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
InMax- 5.10-Y	5 Nm / 10 Nm	7,5/15/30/60/120 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
InMax-15.30-Y	15 Nm / 30 Nm	7,5/15/30/60/120 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S

Quarter turn actuators with spring return, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
InMax-5.10-F	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	-	-	S
InMax- 15-F	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	-	-	S
InMax-5.10-SF	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
InMax- 15-SF	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	S
InMax-5.10-YF	5 Nm / 10 Nm	7,5/15/30/60/120 sec.	~ 3 sec. / 10 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
InMax- 15-YF	15 Nm	7,5/15/30/60/120 sec.	~ 3 sec. / 10 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
InMax-5.10-BF	5 Nm / 10 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	InPro-TT-.. connector	S
InMax- 15-BF	15 Nm	3/15/30/60/120 sec.	~ 3 sec. / 10 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	InPro-TT-.. connector	S

Quarter turn actuators with 1 sec. spring return for Offshore application, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
InMax- 8-F1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	-	-	S
InMax-15-F1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	-	-	S
InMax- 8-SF1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	-	S
InMax-15-SF1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	-	S
InMax- 8-BF1 NEW	8 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	InPro-TT-.. connector	S
InMax-15-BF1	15 Nm	3/15/30/60/120 sec.	≤ 1 sec.	On-off	2 × aux. switches (5°/85°)	InPro-TT-.. connector	S

Accessories and special designs (additional price)

Type	Technical data
InMax-...-VAS	Size „S“, housing material in stainless steel AISI 316, some parts nickel plated
InMax-...-CTS	Size „S“, aluminium housing Amercoat painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
InSwitch	External, adaptable, on site adjustable auxilliary switch with 2 potential free contacts, adaptable to InMax-... actuators
InSwitch-CT	Auxilliary switch, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
InBox-3P	Terminal box connectable to InMax-… actuators with 1 cable for On-off or 3-pos operation
InBox-3P/SW	Terminal box connectable to InMax-… actuators with 1 cable for On-off or 3-pos operation + 2 cable for external aux. switches type InSwitch
InBox-Y/S	Terminal box connectable to InMax-… actuators with 2 cable, for modulating operation or 3-pos + integrated switches (HS)
InBox-Y/S/SW	Terminal box connectable to InMax-… actuators with 2 cable, for modulating or 3-pos operation with feedback signal + 2 cable for external aux. switches
InBox-BF	Terminal box connectable to InMax-… actuators with 1 cable, for all InMax-…-BF
InBox-BF/SW	Terminal box connectable to InMax-… actuators with 1 cable, for all InMax-…-BF + 2 cable for external aux. switches type InSwitch
InBox-.../VA	Terminal-box, housing made of stainless-steel type AISI 316 L, some parts nickel plated, surcharge on aluminium version
InBox-.../CT	Terminal-box, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
MKK-S	Mounting bracket for …Box-terminal boxes for direct coupling to …Max… actuators size „S“
MKK-S/VA	Mounting bracket, made of stainless-steel suitable for InBox…VA
KB-S	Mounting clamp for round damper shaft Ø 10 to 20 mm and squared shafts 10 to 16 mm, incl. bracket, connectable to all InMax-… size „S“
HV-SK, HV-SL	Manual override, connectable to actuators size „S“. HV-SK = short version, HV-SL = long version for add. mounting of ..Box/..Switch (not suitable for ..Max-..-..F1!)
AR-12-xx	Squared reduction part from 12 × 12 mm to shafts with 11 mm (type AR-12-11), 10 mm (type AR-12-10), 8 mm (type AR-12-08)
D-F-...S	Adaptation with flange acc. to DIN EN 5211 for butterfly or ball-valves suitable for size „S“
InPro-TT-...	Safety temperature limiter for fire dampers, switching at 71°/72°C, with 1 m cable, suitable only for InMax-…-BF actuators!
Retrofit-Kit ..Max-S	Mechanical adaptation for mounting on ..Max actuators size „S“, required to replace a previous type NOT15..-F1, NOT12..-F16, NOT15.. or NOT30..

InMax 90° quarter turn actuators „M“ for safe area

Industrial

InMax-...

InMax actuators are NOT Explosion proof and only for use in safe area IP66

Size „M“

Description

InMax are, in acc. with type, for automation of air dampers, fire and smoke dampers, volume control, as well as for ball valves, throttle valves and other quarter turn armatures.

Delivery:
1 actuator, ~ 1 m cable, allen key for manual override, 4 screws.

Features of InMax - ... size „M“

Basics for all InMax-.. size „M“

- **24…240 VAC/DC** self adaptable power supply
- Up to 5 different running times adjustable on site
- 95°angle of rotation (5° for pretension)
- 100% overload protected
- Aluminium housing IP66, cable ~ 1 m
- -40...+40°C/+50°C, integrated heater
- Emergency manual override
- Squared shaft connection 16 × 16 mm
- Dimensions (H × W × D) 287 × 149 × 116 mm

Quarter turn actuators without spring return, 24 to 240 VAC/DC

	Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
	InMax-50.75	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	-	-	M
	InMax- 100	100 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	-	-	M
NEW	InMax- 150	150 Nm	40/60/90/120 sec.	-	On-off, 3-pos	-	-	M
	InMax-50.75-S	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
	InMax- 100-S	100 Nm	40/60/90/120/150 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
NEW	InMax- 150-S	150 Nm	40/60/90/120 sec.	-	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
	InMax-50.75-Y	50 Nm / 75 Nm	40/60/90/120/150 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
	InMax- 100-Y	100 Nm	40/60/90/120/150 sec.	-	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M

Quarter turn actuators with spring return, 24 to 240 VAC/DC

	Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
	InMax-30-F	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
	InMax-50-F	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
NEW	InMax-60-F	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	-	-	M
	InMax-30-SF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
	InMax-50-SF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
NEW	InMax-60-SF	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	-	M
	InMax-30-YF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
	InMax-50-YF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	3-pos, 0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	M
	InMax-30-BF	30 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	InPro-TT-.. connector	M
	InMax-50-BF	50 Nm	40/60/90/120/150 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	InPro-TT-.. connector	M
NEW	InMax-60-BF	60 Nm	40/60/90/120 sec.	~ 20 sec.	On-off, 3-pos	2 × aux. switches (5°/85°)	InPro-TT-.. connector	M

Quarter turn actuators with 3 sec. spring return for Offshore application, 24 to 240 VAC/DC

Type	Torque	Running time 90°	Spring return	Control mode	Feedback	Features	Size
InMax-30-F3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	-	-	M
InMax-50-F3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	-	-	M
InMax-30-SF3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	-	M
InMax-50-SF3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	-	M
InMax-30-BF3	30 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	InPro-TT-.. connector	M
InMax-50-BF3	50 Nm	40/60/90/120/150 sec.	≤ 3 sec.	On-off	2 × aux. switches (5°/85°)	InPro-TT-.. connector	M

Accessories and special designs (additional price)

Type	Technical data
InMax-...-CTM	Size „M“, aluminium housing Amercoat painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
InSwitch	External, adaptable, on site adjustable auxilliary switch with 2 potential free contacts, adaptable to InMax-… actuators
InSwitch-CT	Auxilliary switch, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
InBox-3P	Terminal box connectable to InMax-… actuators with 1 cable for On-off or 3-pos operation
InBox-3P/SW	Terminal box connectable to InMax-… actuators with 1 cable for On-off or 3-pos operation + 2 cable for external aux. switches type InSwitch
InBox-Y/S	Terminal box connectable to InMax-… actuators with 2 cable, for modulating operation or 3-pos + integrated switches (HS)
InBox-Y/S/SW	Terminal box connectable to InMax-… actuators with 2 cable, for modulating or 3-pos operation with feedback signal + 2 cable for external aux. switches
InBox-BF	Terminal box connectable to InMax-… actuators with 1 cable, for all ExMax-…-BF
InBox-BF/SW	Terminal box connectable to InMax-… actuators with 1 cable, for all InMax-…-BF + 2 cable for external aux. switches type InSwitch
InBox-.../CT	Terminal-box, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
MKK-M	Mounting bracket for …Box-terminal boxes for direct coupling to …Max… actuators size „M“
HV-MK	Manual override, connectable to actuators size „M“ (not suitable for ..Max-..-..F3!)
AR-16-xx	Squared reduction part from 16 × 16 mm to shafts with 14 mm (type AR-16-14), 12 mm (type AR-16-12)
D-F-...M	Adaptation with flange acc. to DIN EN 5211 for butterfly or ball-valves suitable for size „M“
InPro-TT-...	Safety temperature limiter for fire dampers, switching at 71°/72°C, with 1 m cable, suitable only for InMax-…-BF actuators!
Retrofit-Kit ..Max-M	Mechanical adaptation for mounting on ..Max actuators size „M“, required to replace a previous type NOT30..-F3, NOT50..-F3 or NOT50..

Electrical drive engineering for valves

Overview ..Max + LIN linear guide unit, ..Run valve actuators and ..Plus linear actuators

The actuator series are subdivided in 3 installation- and 3 application-areas.

Installation-areas:

ExMax-..+LIN, ExRun-.., ExPlus- ..... actuators for use in hazardous areas zone 1, 2, 21, 22
RedMax-..+LIN, RedRun-.., RedPlus-.. actuators for use in hazardous areas zone 2, 22
InMax-..+LIN, InRun-.., InPlus- ..... actuators for use in safe area

Application-areas:

Ex/Red/InMax + LIN ..... for globe- or 3-way valves
Ex/Red/InRun ..... for globe- or 3-way valves
Ex/Red/InPlus ..... for linear motion

The actuator concept offers obvious advantages:

1. Small dimension, compact, easy installation, highest protection classes, cost effective
2. Universal power supply 24 to 240 Volt AC/DC, selfadjustable
3. With or without spring return (spring return only by ..Max + LIN linear guide unit)
4. Robust aluminium housing, IP66
5. Integrated heater for low temperatures
6. On site adjustable motor running time
7. Integrated manual override
8. Useful accessories such as retrofit limit switches

N **ExMax..+LIN**

10 mm-
42 mm

Actuators with spring return for 2-way and 3-way valves

ExMax.., RedMax.., InMax.. + LIN linear guide unit

Linear motion valve actuators with spring return from 500 to 3.000 N. Fixed stroke with 10, 15, 20, 30, or 42 mm, for automation of globe- or 3-way valves. Linkage to numerous valve types and brands available.

N **ExRun..**

5 mm-
60 mm

Actuators for 2-way and 3-way valves

ExRun.., RedRun.., InRun.. valve actuators

Valve actuators from 500 to 10.000 N. On site adjustable stroke from 5 to 60 mm, for automation of globe- or 3-way valves. Linkage to numerous valve types and brands available.

N **ExPlus..**

0 mm-
300 mm

Actuators with long stroke

ExPlus.., RedPlus.., InPlus.. linear actuators

Linear actuators with forces from 300 to 3.000 N and stroke lengths up to 300 mm, for linear motion or rotary operation via lever.

Safe area | **Ex area**

..Max-.. + LIN-.. Linear valve actuators size „S“ and „M“ *with spring return*

NEW

Explosion proof

ExMax-.. + LIN-..*

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II 2(1) G Ex d [ia] IIC T6
II 2(1) D Ex tD [iaD] A21 IP66 T80 °C
ATEX 94/9/EC
IECEx

* Explosion proof apply to ExMax-.. actuator

RedMax-.. + LIN-..*

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II 3(1) G Ex nC [ia] IIC T6
II 3 G Ex nC II T6
II 3 D Ex tD A22 IP66 T80 °C
ATEX 94/9/EC
IECEx

* Explosion proof apply to RedMax-.. actuator

Industrial

InMax-.. + LIN-..*

InMax actuators are
NOT Explosion proof and
only for
use in safe area
IP66

* Protection apply to InMax-.. actuator

Features ..Max-.. + LIN-.. (size „S“ and „M“)

Description

..Max-.. + LIN-.. linear valve actuators **with spring return** for automation of globe- or 3-way valves.
Use as actuator with safety function, On-off or 3-pos. actuator or modulating actuator.

Delivery: Linear unit, suitable for all ..Max-..-F actuators size „S“ or „M“.

Neccessary accessories:
Valve adaptation in accordance with valve manufacturer, type and nominal size (diameter).

Ordering example:
Modulating valve actuator with spring return in Ex area zone 2, for a globe valve with 20 mm stroke and a required force of 1.500 N.

Actuator:	RedMax-30-YF
Linear adaptation:	LIN-20
Valve adaptation:	suitable for valve type on requ.
Optional:	Ex terminal box (RedBox-Y/S)
Optional:	Mounting bracket (MKK-M)

Basics for ..Max-.. + LIN-.. valve actuators

- 24…240 VAC/DC self adaptable power supply
- Running time 0,1…15 sec./mm [1]
- Stroke 10, 15, 20, 30, 42 mm [1]
- Force 500…3.000 N [1]
- Spring return 3/10 sec. (size „S“) 20 sec. (size „M“) [1]
- Control mode On-off, 3-pos., 0-10 VDC, 4-20 mA [1]
- Aluminium housing, IP66 [2]
- Ambient temperature -20…+40 °C (T6), -20…+50 °C (T5)
- Weight (incl. actuator) ~ 8 kg (size „S“), ~ 14 kg (size „M“) [1]
- External terminal box optional [2]
- ExMax + LIN use in zone 1, 2, 21, 22
- RedMax + LIN use in zone 2, 22
- InMax + LIN use in safe area

[1] in acc. with type | [2] applies for actuator

Overview table with recommended actuator ..Max-..-F in acc. of force (N) and max. stroke (mm)

Type LIN	LIN-10	LIN-15	LIN-20	LIN-30	LIN-40	Actuators
Force \ Stroke	10 mm	15 mm	20 mm	30 mm	42 mm	
500 N	..Max-15-F	..Max-15-F	..Max-15-F	..Max-15-F	..Max-30-F	
800 N	..Max-15-F	..Max-15-F	..Max-15-F	..Max-30-F	..Max-30-F	
1.000 N	..Max-15-F	..Max-15-F	..Max-30-F	..Max-30-F	..Max-50-F	**suitable actuators with spring return see page 6-11**
1.500 N	..Max-15-F	..Max-30-F	..Max-30-F	..Max-50-F	..Max-50-F	
2.000 N	..Max-30-F	..Max-30-F	..Max-50-F	..Max-50-F	–	
2.500 N	..Max-30-F	..Max-50-F	..Max-50-F	–	–	
3.000 N	..Max-30-F	..Max-50-F	..Max-50-F	–	–	

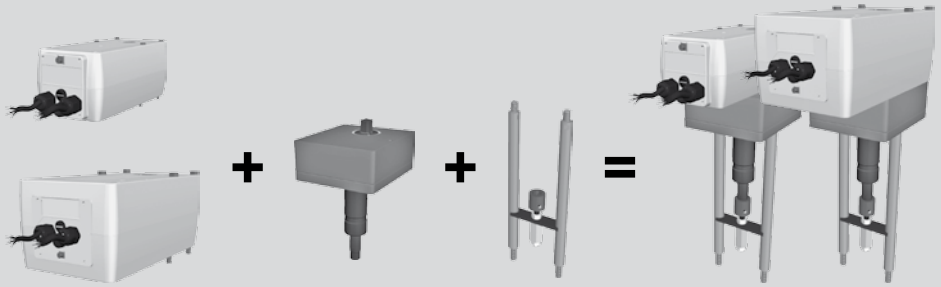
By intermediate strokes the next bigger actuator is required!

Linear unit for actuators with spring return, 24 to 240 VAC/DC

Type	Stroke (max.)	Description
LIN-10	10 mm	Linear unit up to max. 10 mm stroke, suitable for all ..Max-..-F actuators size „S“ or „M“ with spring return
LIN-15	15 mm	Linear unit up to max. 15 mm stroke, suitable for all ..Max-..-F actuators size „S“ or „M“ with spring return
LIN-20	20 mm	Linear unit up to max. 20 mm stroke, suitable for all ..Max-..-F actuators size „S“ or „M“ with spring return
LIN-30	30 mm	Linear unit up to max. 30 mm stroke, suitable for all ..Max-..-F actuators size „S“ or „M“ with spring return
LIN-40	42 mm	Linear unit up to max. 42 mm stroke, suitable for all ..Max-..-F actuators size „S“ or „M“ with spring return
LIN-..-CT	Type as above, but with Amercoat painted aluminium housing, resistant against corrosive and/or maritime atmosphere. Lifting rod, connecting parts and screws in VA	

Additional price for CT version. Additional price for adaptation, dependent on valve manufacturer, -type and stroke. Additional price for adaptation in stainless steel (VA) for CT version.

Mounting variations



Actuator ..Max-..-F | LIN-.. | Adaptation | Valve actuator with spring return

Valve adaptation

To select the right valve adaptation and get the right price information the following data are required:

1. **Valve manufacturer**
2. **Valve type**
3. **Valve nominal size (diameter) DN**

For adaptations which are still designed by Schischek this data are minimum requirements.

To design new adaptations we need additional details of the valve body as well as drawings.

At purchase order you have to order both parts actuator + adaptation.

ExRun / RedRun / InRun Valve actuators size „S“

Explosion proof

ExRun...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II 2(1) G Ex de [ia] IIC T6
II 2(1) D Ex tD [iaD] A21 IP66 T80
ATEX 94/9/EC

RedRun...

Explosion proof, zone 2, 22
gas + dust, PTB-certified
II 3(1) G Ex nC [ia] IIC T6
II 3 G Ex nC II T6
II 3 D Ex tD A22 IP66 T80°C
II3(1) D Ex tD [iaD] A22 IP66 T80°C
ATEX 94/9/EC

Industrial

InRun...

InRun actuators are
NOT Explosion proof and
only for
use in safe area
IP66

Features of ExRun, RedRun, InRun

Description

ExRun, RedRun and InRun valve actuators are used for automation of 2- and 3-way valves with 3-pos. on-off or modulating mode.

Delivery:
1 actuator with integrated Ex-e terminal box, Emergency manual override.

Necessary accessories:
Valve adaptation in accordance with valve manufacturer, type and nominal size (diameter).

Basics for all ...Run valve actuators

- **24...240 VAC/DC** self adaptable power supply
- Up to 5 different running times adjustable on site
- 5 to 60 mm stroke, mechanical limitation on each position
- Automatic adaptation of modulating signal at Ex-, Red-, InRun-...-Y..
- Aluminium housing IP66, integrated terminal box
- -20...+40°C / +50°C, integrated heater
- Emergency manual override
- Dimension (H* × W × D) 260 × 208 × 115 mm (dimension without adaptation)

*Height = variable, depending on type

Ex-d valve actuators without spring return, 24 to 240 VAC/DC

Type	Force	Running time	Spring return	Control mode	Feedback	Features	Size
ExRun- 5.10-X	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	ExSwitch not adaptable!	S
ExRun- 25.50-X	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	ExSwitch not adaptable!	S
ExRun-75.100-X	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	ExSwitch not adaptable!	S
ExRun- 5.10	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	-	S
ExRun- 25.50	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	-	S
ExRun-75.100	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	-	S
ExRun- 5.10-S	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
ExRun- 25.50-S	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
ExRun-75.100-S	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
ExRun- 5.10-P	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
ExRun- 25.50-P	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
ExRun-75.100-P	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
ExRun- 5.10-Y	500 / 1.000 N	2/3/6/9/12 sec/mm	-	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-	S
ExRun- 25.50-Y	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-	S
ExRun-75.100-Y	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-	S
ExRun- 5.10-U	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	0...10 VDC, 4...20 mA	-	S
ExRun- 25.50-U	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	0...10 VDC, 4...20 mA	-	S
ExRun-75.100-U	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	0...10 VDC, 4...20 mA	-	S

❗ Switching points are fix! (see table)

Ex-n valve actuators without spring return, 24 to 240 VAC/DC

Type	Force	Running time	Spring return	Control mode	Feedback	Features	Size
RedRun- 5.10-X	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	RedSwitch not adaptable!	S
RedRun- 25.50-X	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	RedSwitch not adaptable!	S
RedRun-75.100-X	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	RedSwitch not adaptable!	S
RedRun- 5.10	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	-	S
RedRun-25.50	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	-	S
RedRun-75.100	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	-	S
RedRun- 5.10-S	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
RedRun- 25.50-S	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
RedRun-75.100-S	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
RedRun- 5.10-P	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
RedRun- 25.50-P	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
RedRun-75.100-P	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
RedRun- 5.10-Y	500 / 1.000 N	2/3/6/9/12 sec/mm	-	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-	S
RedRun- 25.50-Y	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-	S
RedRun-75.100-Y	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-	S
RedRun- 5.10-U	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	0...10 VDC, 4...20 mA	-	S
RedRun- 25.50-U	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	0...10 VDC, 4...20 mA	-	S
RedRun-75.100-U	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	0...10 VDC, 4...20 mA	-	S

❗ Switching points are fix! (see table)

Valve actuators without spring return, 24 to 240 VAC/DC

Type	Force	Running time	Spring return	Control mode	Feedback	Features	Size
InRun- 5.10-X	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	InSwitch not adaptable!	S
InRun- 25.50-X	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	InSwitch not adaptable!	S
InRun-75.100-X	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	InSwitch not adaptable!	S
InRun- 5.10	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	-	S
InRun- 25.50	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	-	S
InRun-75.100	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	-	S
InRun- 5.10-S	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
InRun- 25.50-S	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
InRun-75.100-S	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	-	2 aux. switch, fixed switching points ❗	S
InRun- 5.10-P	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
InRun- 25.50-P	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
InRun-75.100-P	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	potentiometer 1.000 Ω	-	S
InRun- 5.10-Y	500 / 1.000 N	2/3/6/9/12 sec/mm	-	0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
InRun- 25.50-Y	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
InRun-75.100-Y	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	0…10 VDC, 4...20 mA	0…10 VDC, 4...20 mA	-	S
InRun- 5.10-U	500 / 1.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	0…10 VDC, 4...20 mA	-	S
InRun- 25.50-U	2.500 / 5.000 N	2/3/6/9/12 sec/mm	-	On-off, 3-pos	0…10 VDC, 4...20 mA	-	S
InRun-75.100-U	7.500 / 10.000 N (8.000 N)	4/6/9/12/15 sec/mm	-	On-off, 3-pos	0…10 VDC, 4...20 mA	-	S

❗ Switching points are fix! (see table)

Accessories and special designs (additional price)

Type	Technical data
..Run-..-CTS	Size „S“, aluminium housing with Amercoat painting, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
ExSwitch-R	External, adaptable, on site adjustable Ex-d auxilliary switch for ExRun-.. with 2 potential free contacts, additionally Ex-e terminal box + mounting bracket necessary
RedSwitch-R	External, adaptable, on site adjustable auxilliary switch for RedRun-.. with 2 potential free contacts, additionally terminal box + mounting bracket necessary
InSwitch-R	External, adaptable, on site adjustable auxilliary switch for InRun-.. with 2 potential free contacts, additionally terminal box + mounting bracket necessary
NEW ..Switch-R-CT	Auxilliary switch like before, but with Amercoat painting, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
NEW ExSwitch-R-L	External, adaptable, on site adjustable Ex-d auxilliary switch linear for ExRun-.. with 2 potential free contacts, additionally Ex-e terminal box + mounting bracket necessary
ExBox-SW	Ex-e terminal box suitable for ExRun.. valve-actuators with external switches ExSwitch
RedBox-SW	Ex-e terminal box suitable for RedRun.. valve-actuators with external switches RedSwitch
InBox-SW	Terminal box suitable for InRun.. valve-actuators with external switches InSwitch
MKK-S	Mounting-bracket suitable for ..Box-terminal boxes for direct mounting on ..Run actuators size „S“
HV-R	Manual override suitable for ..Run valve actuators size „S“
Adaptation	Different adaptations for different valve types and sizes available. Please don't hesitate to ask for technical solution
GMB-1	Rubber bellow up to 60 mm, colour black

Gear belt adjustment	Switchpoint	
	Lifting rod retracted (Terminals 1, 2, 3)	Lifting rod extended (Terminals 4, 5, 6)
10 mm	1 mm	10 mm
20 mm	1 mm	19 mm
30 mm	1 mm	28 mm
60 mm	1 mm	55 mm

❗ Other switching points to be realized with adaptable, external auxilliary switches type Ex-/Red-/InSwitch!

Required data for valve adaptation

To select the right valve adaptation and get the right price information the following data are required:

1. **Valve manufacturer**
2. **Valve type**
3. **Valve nominal size (diameter) DN**

For adaptations which are still designed by Schischek this data are minimum requirements.

To design new adaptations we need additional details of the valve body as well as drawings.

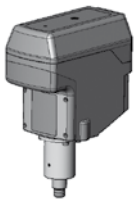
At purchase order you have to order both parts actuator + adaptation.

…Run + valve adaptation

ExRun-…

RedRun-…

InRun-…



+

Adaptation

ExPlus / RedPlus / InPlus Linear actuators size „S“ up to 300 mm stroke

Explosion proof

ExPlus...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2G.. / II2D..
ATEX 94/9/EC

RedPlus...

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3G.. / II3D..
ATEX 94/9/EC

Industrial

InPlus...

InPlus actuators are
NOT Explosion proof and
only for
use in safe area
IP66

Features of ExPlus, RedPlus, InPlus

Description

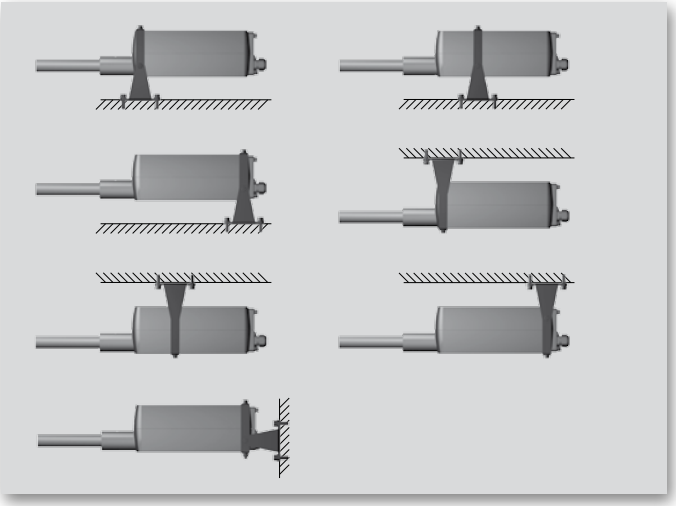
ExPlus, RedPlus and InPlus actuators for linear motion or rotary operation via lever. Types Ex-Red-In are different in certification, but with same functions and dimension.

Delivery:
1 actuator with 1 m cable
1 linkage
1 mounting bracket

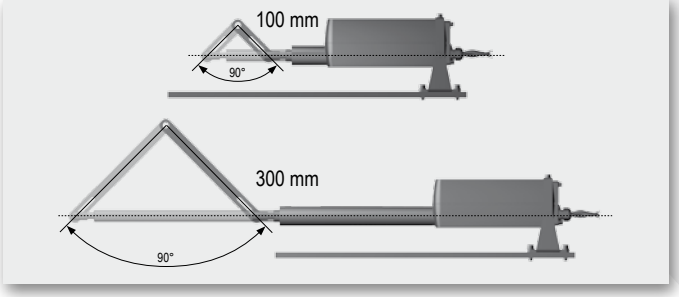
Basics for all ...Plus actuators

- **24...240 VAC/DC** self adaptable power supply
- Up to 3 different running times adjustable on site
- 100 % overload protected
- Aluminium housing IP66
- Integrated heater, -40...+40°C / +50°C
  In acc. with type:
- 300 up to 3.000 N force
- 100 and 300 mm stroke
- On-off, 3-pos, 0-10 VDC, 4-20 mA
- Weight ~ 3,5 kg (..Plus-..-100),
  ~ 4 kg (..Plus-..-300)
- ExPlus for installation in zone 1, 2, 21, 22
- RedPlus for installation in zone 2, 22
- InPlus for installation in the safe area

Mounting variations



Stroke variations



Force	Torque at stroke 100 mm	200 mm	300 mm
300 N	15 Nm	30 Nm	45 Nm
500 N	25 Nm	50 Nm	75 Nm
1.000 N	50 Nm	100 Nm	150 Nm
3.000 N	150 Nm	300 Nm	450 Nm

ExPlus... Ex-d linear actuators, 24...240 VAC/DC, zone 1, 2, 21, 22

Type	Force	Stroke	Running time	Control mode	Feedback	Features
ExPlus- 3.5-100-X	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	ExSwitch not adaptable!
ExPlus- 3.5-300-X	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	ExSwitch not adaptable!
ExPlus-10.15-100-X	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	ExSwitch not adaptable!
ExPlus-10.15-300-X	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	ExSwitch not adaptable!
ExPlus- 30-100-X	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	ExSwitch not adaptable!
ExPlus- 30-300-X	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	ExSwitch not adaptable!
ExPlus- 3.5-100	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
ExPlus- 3.5-300	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
ExPlus-10.15-100	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
ExPlus-10.15-300	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
ExPlus- 30-100	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
ExPlus- 30-300	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
ExPlus- 3.5-100-Y	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
ExPlus- 3.5-300-Y	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
ExPlus-10.15-100-Y	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
ExPlus-10.15-300-Y	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
ExPlus- 30-100-Y	3.000 N	100 mm	1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
ExPlus- 30-300-Y	3.000 N	300 mm	1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
ExPlus- 3.5-100-U	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
ExPlus- 3.5-300-U	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
ExPlus-10.15-100-U	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
ExPlus-10.15-300-U	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
ExPlus- 30-100-U	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
ExPlus- 30-300-U	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-

RedPlus... Ex-n linear actuators, 24...240 VAC/DC, zone 2, 22

Type	Force	Stroke	Running time	Control mode	Feedback	Features
RedPlus- 3.5-100-X	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	RedSwitch not adaptable!
RedPlus- 3.5-300-X	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	RedSwitch not adaptable!
RedPlus-10.15-100-X	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	RedSwitch not adaptable!
RedPlus-10.15-300-X	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	RedSwitch not adaptable!
RedPlus- 30-100-X	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	RedSwitch not adaptable!
RedPlus- 30-300-X	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	RedSwitch not adaptable!
RedPlus- 3.5-100	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
RedPlus- 3.5-300	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
RedPlus-10.15-100	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
RedPlus-10.15-300	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
RedPlus- 30-100	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
RedPlus- 30-300	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
RedPlus- 3.5-100-Y	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
RedPlus- 3.5-300-Y	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
RedPlus-10.15-100-Y	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
RedPlus-10.15-300-Y	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
RedPlus- 30-100-Y	3.000 N	100 mm	1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
RedPlus- 30-300-Y	3.000 N	300 mm	1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
RedPlus- 3.5-100-U	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
RedPlus- 3.5-300-U	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
RedPlus-10.15-100-U	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
RedPlus-10.15-300-U	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
RedPlus- 30-100-U	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
RedPlus- 30-300-U	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-

InPlus... linear actuators, 24...240 VAC/DC, safe area (Industrial application, NON Ex)

Type	Force	Stroke	Running time	Control mode	Feedback	Features
InPlus- 3.5-100-X	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	InSwitch not adaptable!
InPlus- 3.5-300-X	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	InSwitch not adaptable!
InPlus-10.15-100-X	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	InSwitch not adaptable!
InPlus-10.15-300-X	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	InSwitch not adaptable!
InPlus- 30-100-X	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	InSwitch not adaptable!
InPlus- 30-300-X	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	InSwitch not adaptable!
InPlus- 3.5-100	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
InPlus- 3.5-300	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
InPlus-10.15-100	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
InPlus-10.15-300	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
InPlus- 30-100	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
InPlus- 30-300	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	-	-
InPlus- 3.5-100-Y	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
InPlus- 3.5-300-Y	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
InPlus-10.15-100-Y	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
InPlus-10.15-300-Y	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
InPlus- 30-100-Y	3.000 N	100 mm	1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
InPlus- 30-300-Y	3.000 N	300 mm	1,0 / 2,0 sec/mm	0...10 VDC, 4...20 mA	0...10 VDC, 4...20 mA	-
InPlus- 3.5-100-U	300 N / 500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
InPlus- 3.5-300-U	300 N / 500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
InPlus-10.15-100-U	1.000 N / 1.500 N	100 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
InPlus-10.15-300-U	1.000 N / 1.500 N	300 mm	0,5 / 1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
InPlus- 30-100-U	3.000 N	100 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-
InPlus- 30-300-U	3.000 N	300 mm	1,0 / 2,0 sec/mm	On-off, 3-pos	0...10 VDC, 4...20 mA	-

Accessories and special designs (additional price)

Type	Technical data
..Plus-..-CTS	Size „S“, aluminium housing with Amercoat painting, resistant against corrosive and/or maritime atmosphere, some parts nickel plated
ExSwitch-P	External, adaptable, on site adjustable Ex-d auxilliary switch with 2 potential free contacts, adaptable to ExPlus-.. actuators
RedSwitch-P	External, adaptable, on site adjustable auxilliary switch with 2 potential free contacts, adaptable to RedPlus-.. actuators
InSwitch-P	External, adaptable, on site adjustable auxilliary switch with 2 potential free contacts, adaptable to InPlus-.. actuators
NEW ..Switch-P-CT	Auxilliary switch, housing AMERCOAT painted, resistant against corrosive and/or maritime atmosphere, some parts nickel plated, surcharge on aluminium version
MKK-S	Mounting-bracket suitable for ..Box-terminal boxes for direct mounting on ..Plus linear actuators
GMB-2	Rubber bellow up to 100 mm, colour black
GMB-3	Rubber bellow up to 300 mm, colour black

ExBox-... Ex-e terminal boxes see page 6 (Accessories...), **RedBox-...** Ex-e terminal boxes see page 8 (Accessories...), **InBox-...** terminal boxes see page 10 (Accessories...)

ExCos../RedCos../InCos.. Sensors – Overview and accessories

The new ExCos..., RedCos and InCos Sensor-Technology

The sensors are subdevided in 3 installation- and 3 application-areas.

Installation-areas:

ExCos- .....Sensors for Ex-area zone 1, 2, 21, 22
RedCos- .....Sensors for Ex-area zone 2, 22
InCos- .....Sensors for safe area

Application-areas:

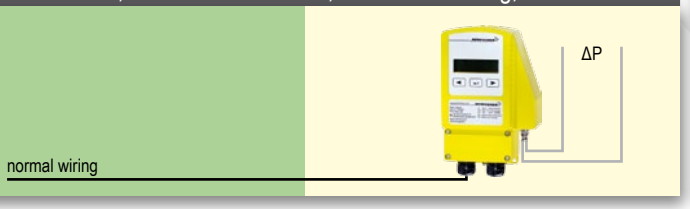
Ex/Red/InCos-P .....sensors for pressure and differential pressure
Ex/Red/InCos-D + ..Pro-C .....active sensor-heads for temperature and/or humidity
Ex/Red/InCos-A + ..Sens .....passive sensors for temperature, humidity and potentiometer

The sensor concept grants enormous advantages to known solutions, especially in hazardous areas:

1. No intrinsically safe wiring required between the control panel and the sensor
2. No intrinsically safe circuit necessary inside the control panel
3. No transducer needed in the electrical control panel
4. Reduced installation cost
5. Easy parameterisation
6. Cost savings for electrical components

ΔP ExCos-P

Pressure, Differential Pressure, VAV – modulating, active

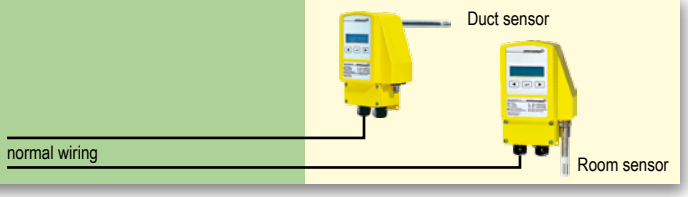


ExCos-P.., RedCos-P.., InCos-P.. Sensors

Transducers with integrated differential-pressure sensor for direct connection of the air-hoses. IP66 aluminium housing with integrated terminal-box. Measuring range parametrizable on site. Outputs 0…10V VDC/4…20 mA. Integrated actual value indication, illuminated.

°C %rH ExCos-D + ExPro-C..

Temperature and/or Humidity – modulating, active



ExCos-D.., RedCos-D.., InCos-D..
Transducer + ExPro-C.., InPro-C.. sensor probe

Transducer for the installation of an ExPro-C.. or InPro-C.. (with InCos-D) for temperature C° and/or humidity in %. IP66 aluminium housing with integrated terminal-box. Measuring-range parametrizable on site. Outputs 0…10V VDC/4…20 mA. Integrated actual value indication, illuminated.

°C %rH ExCos-A + ExSens

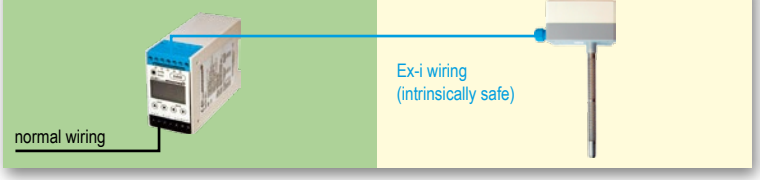
Temperature and/or Humidity, Potentiometer – modulating, passive

ExCos-A.., RedCos-A.., InCos-A..
Transducer + ExSens sensor

Transducer for a connection of an passive, modulating ExSens sensor type Pt 100, Ni 1000, 0…10 kΩ over Ex-i electrical conduit. IP66 aluminium housing with integrated terminal-box. Measuring range parametrizable on site. Outputs 0…10V VDC/4…20 mA. Integrated actual value indication, illuminated.

°C %rH EXL-IMU-1 + ExSens

Temperature, Humidity, Potentiometer – modulating, passive



EXL-IMU-1 transducer + ExSens sensor

Transducer for a connection of an passive, modulating ExSens sensor type Pt 100, Ni 1000, 0…10 kΩ over Ex-i electrical conduit. Installation in control box onto DIN-rail. Measuring range parametrizable at site. Outputs 0…10V VDC/4…20 mA. Integrated actual value indication.

Safe area | **Ex area**

ExCos-P / RedCos-P / InCos-P Differential pressure sensors

Explosion proof

ExCos-P...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2(1)G Ex ema [ia] IIC T6
II2(1)D Ex tD A21 [iaD] IP66 T80°C
ATEX 94/9/EC

RedCos-P...

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3(1)G Ex nC [ia] IIC T6
II3(1)D Ex tD A22 [iaD] IP66 T80°C
ATEX 94/9/EC

Industrial

InCos-P...

InCos sensors are
NOT Explosion proof
and only for
use in safe area
IP66

Features of ExCos-P, RedCos-P, InCos-P sensors

Description

ExCos-P, RedCos-P and InCos-P are pressure sensors for HVAC systems, e.g. for differential pressure control.
VAV control must be tested by the manufacturer of VAV dampers in acc. with diameter, design and characteristics of the air damper.

Delivery:
1 sensor with integrated terminal box

Basics for all ...Cos-P sensors

- No additional module in the panel required!
- No intrinsically safe wiring required!
- 24 VAC/DC supply
- Outputs 0…10 VDC, (0)4…20 mA selectable
- Measurement range adjustable
- Actual value indication (which can be switched off)
- All parameters can be adjusted on site without additional tools and measurement devices
- Aluminium housing IP66
- Integrated terminal box
- Dimensions (H × W × D) 180 × 107 × 66 mm

ExCos-P... Differential pressure and volume control sensors zone 1, 2, 21, 22

Type	Max. range	Overload protected	Measurement range, min. 20% of max. range	Installation module
ExCos-P-100	± 100 Pa	up to 25.000 Pa	± Measurement range free adjustable, min. range 20 Pa	zone 1, 2, 21, 22
ExCos-P-250	± 250 Pa	up to 25.000 Pa	± Measurement range free adjustable, min. range 50 Pa	zone 1, 2, 21, 22
ExCos-P-500	± 500 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 100 Pa	zone 1, 2, 21, 22
ExCos-P-1250	± 1.250 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 250 Pa	zone 1, 2, 21, 22
ExCos-P-2500	± 2.500 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 500 Pa	zone 1, 2, 21, 22
ExCos-P-5000	± 5.000 Pa	up to 75.000 Pa	± Measurement range free adjustable, min. range 1.000 Pa	zone 1, 2, 21, 22
ExCos-P-7500	± 7.500 Pa	up to 120.000 Pa	± Measurement range free adjustable, min. range 1.500 Pa	zone 1, 2, 21, 22

RedCos-P... Differential pressure and volume control sensors zone 2, 22

Type	Max. range	Overload protected	Measurement range, min. 20% of max. range	Installation module
RedCos-P-100	± 100 Pa	up to 25.000 Pa	± Measurement range free adjustable, min. range 20 Pa	zone 2, 22
RedCos-P-250	± 250 Pa	up to 25.000 Pa	± Measurement range free adjustable, min. range 50 Pa	zone 2, 22
RedCos-P-500	± 500 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 100 Pa	zone 2, 22
RedCos-P-1250	± 1.250 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 250 Pa	zone 2, 22
RedCos-P-2500	± 2.500 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 500 Pa	zone 2, 22
RedCos-P-5000	± 5.000 Pa	up to 75.000 Pa	± Measurement range free adjustable, min. range 1.000 Pa	zone 2, 22
RedCos-P-7500	± 7.500 Pa	up to 120.000 Pa	± Measurement range free adjustable, min. range 1.500 Pa	zone 2, 22

InCos-P... Differential pressure and volume control sensors for safe areas

Type	Max. range	Overload protected	Measurement range, min. 20% of max. range	Installation module
InCos-P-100	± 100 Pa	up to 25.000 Pa	± Measurement range free adjustable, min. range 20 Pa	safe area
InCos-P-250	± 250 Pa	up to 25.000 Pa	± Measurement range free adjustable, min. range 50 Pa	safe area
InCos-P-500	± 500 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 100 Pa	safe area
InCos-P-1250	± 1.250 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 250 Pa	safe area
InCos-P-2500	± 2.500 Pa	up to 50.000 Pa	± Measurement range free adjustable, min. range 500 Pa	safe area
InCos-P-5000	± 5.000 Pa	up to 75.000 Pa	± Measurement range free adjustable, min. range 1.000 Pa	safe area
InCos-P-7500	± 7.500 Pa	up to 120.000 Pa	± Measurement range free adjustable, min. range 1.500 Pa	safe area

Accessories and special designs (additional price)

Type	Technical data
NEW ..Cos-P..-CT	Amercoat painted aluminium housing, resistant against corrosive and/or maritime atmosphere. Cable glands nickel-plated, screws in stainless steel
NEW ..Cos-P..-OCT	Offshore version with seawater resistant Amercoat painted aluminium housing. M20 cable glands nickel-plated, pressure connection tubes and screws in stainless steel
Ex/RedCos-P..-A	Module as before, but with one additional intrinsically safe circuit (0)4…20 mA output to connect external actual value indicator
InCos-P..-A	Module as before, but with one additional (0)4…20 mA output to connect external actual value indicator
EXC-RIA-16	Intrinsic safe actual value LCD indicator, for use in zone 1, 2, 21, 22, connectable to ExCos-P..-A or RedCos-P..-A sensors
NOC-RIA-16	LCD indicator, connectable to InCos-P..-A sensors
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)
Installation kit 2	Includes 2 meter pressure hose (inner diameter 6 mm) and 2 plastic fittings

ExCos-D / RedCos-D / InCos-D Temperature / humidity transducer

Explosion proof

ExCos-D...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2(1)G Ex ema [ia] IIC T6
II2(1)D Ex tD A21 [iaD] IP66 T80°C
ATEX 94/9/EC

RedCos-D...

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3(1)G Ex nC [ia] IIC T6
II3(1)D Ex tD A22 [iaD] IP66 T80°C
ATEX 94/9/EC

Industrial

InCos-D...

InCos sensors are
NOT Explosion proof
and only for
use in safe area
IP66

Features ExCos-D, RedCos-D, InCos-D transducer

Description

ExCos-D, RedCos-D and InCos-D transducer together with ExPro-C… / InPro-C… digital sensors are for temperature and / or humidity measurement in HVAC systems.
Delivery: 1 transducer with connection for 1 ExPro-C… sensor
Required accessory (additional price):
1 ExPro-C… or InPro-C… sensor
Ordering example for 1 temperature duct sensing, 150 mm sensor tube, additional external value indication, sensor in zone 21, indicator in zone 22.
Types to order:
1 x ExCos-D + type addition …- A (Ex-i transducer)
1 x ExPro-CT150 + (Ex-i sensor)
1 x EXC-RIA-261 (Ex-i indicator)

Basics for all …Cos-D sensors

- No additional module in the panel required!
- No intrinsically safe wiring required!
- 24 VAC / DC supply
- Connector for ExPro-C… sensors for room or duct mounting
- Outputs 0…10 VDC, 4…(0)20 mA selectable
- Measurement range adjustable
- Actual value indication (which can be switched off)
- All parameters can be adjusted on site without additional tools and measurement devices
- Aluminium housing IP66
- Integrated terminal box
- Dimensions (H × W × D) 180 × 107 × 66 mm
- ExCos-D for zone 1, 2, 21, 22
- RedCos-D for zone 2, 22
- InCos-D for safe area

ExCos-D temperature- / humidity module for zone 1, 2, 21, 22

Type	Technical data	Installation module	Installation ExPro sensor
ExCos-D	Module to connect 1 ExPro-C… sensor for temperture and / or humidity for use in hazardous areas	zone 1, 2, 21, 22	zone 1, 2, 21, 22

RedCos-D temperature- / humidity module for zone 2, 22

Type	Technical data	Installation module	Installation ExPro sensor
RedCos-D	Module to connect 1 ExPro-C… sensor for temperture and / or humidity for use in hazardous areas	zone 2, 22	zone 1, 2, 21, 22

InCos-D temperature- / humidity module for safe area

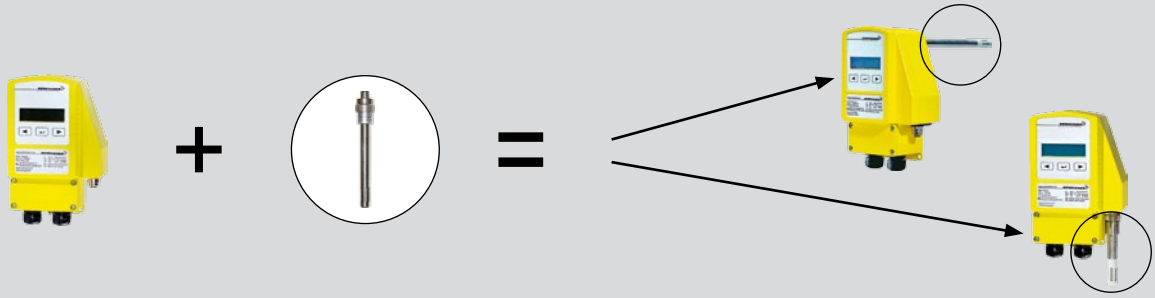
Type	Technical data	Installation module	Installation InPro sensor
InCos-D	Module to connect 1 InPro-C… sensor for temperture and / or humidity for use in safe area	safe area	safe area

Accessories and special designs (additional price)

Type	Technical data
..Cos-D-CT NEW	Amercoat painted aluminium housing, resistant against corrosive and / or maritime atmosphere. Cable glands nickel-plated, screws in stainless steel
Ex/RedCos-D-A	Module as before, but with two* additional intrinsic safe circuit (0)4…20 mA outputs to connect external actual value indicator
InCos-D-A	Module as before, but with two* additional (0)4…20 mA outputs to connect external actual value indicators
EXC-RIA-16	Intrinsic safe actual value LCD indicator, for use in zone 1, 2, 21, 22, connectable to ExCos-D-A or RedCos-D-A sensors
NOC-RIA-16	Actual value LCD indicator, for use in safe area, connectable to InCos-D-A sensors
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)
VL3 NEW	Sensor extension cable 3 m

*Output 1 = for °C, Output 2 = for %rH

Example of combinations



ExPro-C…/InPro-C… Digital temperature/humidity sensors

Explosion proof | Industrial | Features ExPro-C…, InPro-C… sensors

ExPro-C…

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified in acc.
with ExCos-D
and RedCos-D
transducer
ATEX 94/9/EC

InPro-C…

Only for use with InCos-D… transducers!
NOT for use in Ex area!

Description

ExPro-C… sensors are used for measurements of temperature and/or humidity in hazardous areas, for **exclusive** use with ExCos-D… / RedCos-D… transducers!

InPro-C… sensors are suitable for temperature and/or humidity measurement in safe areas, for **exclusive** use with InCos-D… transducers!

Delivery: 1 sensor with connector
Example: room-humidity sensor, 50 mm length
Type: 1 x ExPro-CF-50

Attention: only in combination with:
1 × ExCos-D or RedCos-D
(InCos-D by InPro-C… sensors)

Basics for all ExPro-C…/InPro-C… sensors

- Sensors for connection to ExCos-D…, RedCos-D… transducers. Mechanical and electrical adaptation via connector
- ExPro-C…/InPro-C… sensors can be optionally screwed to the housing at the back (duct measurement) or bottom (room measurement)
- When using humidity-sensors, the contamination and aggressiveness of the medium has to be regarded

Sensor probes for ExCos-D and RedCos-D transducer

Type	Function	Range	Sensor length	Main use	Connectable to		Installation area
ExPro-CT - 50	Temperature sensor	- 40…+ 80 °C	50 mm	Room/Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CT -100	Temperature sensor	- 40…+ 125 °C	100 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CT -150	Temperature sensor	- 40…+ 125 °C	150 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CT -200	Temperature sensor	- 40…+ 125 °C	200 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CF - 50	Humidity sensor	0…100 %rF	50 mm	Room/Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CF -100	Humidity sensor	0…100 %rF	100 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CF -150	Humidity sensor	0…100 %rF	150 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CF -200	Humidity sensor	0…100 %rF	200 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CTF- 50	Combination temperature/humidity	- 40…+ 80 °C, 0…100 %rH	50 mm	Room/Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CTF-100	Combination temperature/humidity	- 40…+ 125 °C, 0…100 %rH	100 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CTF-150	Combination temperature/humidity	- 40…+ 125 °C, 0…100 %rH	150 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22
ExPro-CTF-200	Combination temperature/humidity	- 40…+ 125 °C, 0…100 %rH	200 mm	Duct	ExCos-D	RedCos-D	zone 1, 2, 21, 22

Sensor probes for InCos-D transducer

Type	Function	Range	Sensor length	Main use	Connectable to	Installation area
InPro-CT - 50	Temperature sensor	- 40…+ 80 °C	50 mm	Room/Duct	InCos-D	safe area
InPro-CT -100	Temperature sensor	- 40…+ 125 °C	100 mm	Duct	InCos-D	safe area
InPro-CT -150	Temperature sensor	- 40…+ 125 °C	150 mm	Duct	InCos-D	safe area
InPro-CT -200	Temperature sensor	- 40…+ 125 °C	200 mm	Duct	InCos-D	safe area
InPro-CF - 50	Humidity sensor	0…100 %rF	50 mm	Room/Duct	InCos-D	safe area
InPro-CF -100	Humidity sensor	0…100 %rF	100 mm	Duct	InCos-D	safe area
InPro-CF -150	Humidity sensor	0…100 %rF	150 mm	Duct	InCos-D	safe area
InPro-CF -200	Humidity sensor	0…100 %rF	200 mm	Duct	InCos-D	safe area
InPro-CTF- 50	Combination temperature/humidity	- 40…+ 80 °C, 0…100 %rH	50 mm	Room/Duct	InCos-D	safe area
InPro-CTF-100	Combination temperature/humidity	- 40…+ 125 °C, 0…100 %rH	100 mm	Duct	InCos-D	safe area
InPro-CTF-150	Combination temperature/humidity	- 40…+ 125 °C, 0…100 %rH	150 mm	Duct	InCos-D	safe area
InPro-CTF-200	Combination temperature/humidity	- 40…+ 125 °C, 0…100 %rH	200 mm	Duct	InCos-D	safe area

Accessories (additional price)

Type	Technical data
MFK	Mounting flange for duct-installation, for variable depth of immersion in the air duct
TH-VA	Probe made of stainless-steel V4A 1.4571, length 120 mm. Other lengths on request
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)

ExCos-A / RedCos-A / InCos-A Temperature / humidity transducer

Explosion proof

ExCos-A...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2(1)G Ex ema [ia] IIC T6
II2(1)D Ex tD A21 [iaD] IP66 T80°C
ATEX 94/9/EC

RedCos-A...

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3(1)G Ex nC [ia] IIC T6
II3(1)D Ex tD A22 [iaD] IP66 T80°C
ATEX 94/9/EC

Industrial

InCos-A...

InCos sensors are
NOT Explosion proof
and only for
use in safe area
IP66

Features of ExCos-A, RedCos-A, InCos-A

Description

ExCos-A, RedCos-A and InCos-A transducer together with modulating ExSens passive sensors are for temperature or humidity measurement in HVAC systems.
Delivery: 1 transducer with connection for modulating
1 ExSens sensor
Required accessory (additional price):
1 ExSens sensor, see next page
Ordering example for measuring of temperature in air duct, with Pt 100 in zone 1.
Types to order:
1 × ExCos-A (Ex-i transducer)
1 × TFR-2G (Ex-i sensor)

Basics for all ...Cos-A transducer

- No additional module in the panel required!
- No intrinsically safe wiring required!
- 24 VAC/DC supply
- Connector for 1 ExSens sensor for room or duct mounting
- Outputs: 0…10 VDC, (0)4…20 mA selectable
- Input: Pt 100, Pt 500, Pt 1000, Ni 100, Ni 200, Ni 500, Ni 1000, Ni 1000 Siemens, KP 250, Passive sensors with resistance output 0…1.000 Ohm, 0…10.000 Ohm
- Measuring range adjustable
- Actual value indication (which can be switched off)
- All parameters can be adjusted on site without additional tools and measurement devices
- Aluminium housing IP66
- Integrated terminal box
- Dimensions (H × W × D) 180 × 107 × 66 mm
- ExCos-A for zone 1, 2, 21, 22
- RedCos-A for zone 2, 22
- InCos-A for safe area

ExCos-A Transducer for passive sensors for zone 1, 2, 21, 22

Type	Technical data	Installation module	Installation sensor*
ExCos-A	Module to connect 1 modulating ExSens sensor for temperture or humidity for use in hazardous areas	zone 1, 2, 21, 22	zone 0, 1, 2, 20, 21, 22

* in acc. with certification of sensor!

RedCos-A Transducer for passive sensors for zone 2, 22

Type	Technical data	Installation module	Installation sensor*
RedCos-A	Module to connect 1 modulating ExSens sensor for temperture or humidity for use in hazardous areas	zone 2, 22	zone 0, 1, 2, 20, 21, 22

* in acc. with certification of sensor!

InCos-A Transducer for passive sensors for safe area

Type	Technical data	Installation module	Installation sensor
InCos-A	Module to connect 1 modulating sensor for temperture or humidity for use in safe area Sensors: all passive sensors like Pt 100, Pt 1000, Ni 100, 200, 1000	safe area	safe area

Accessories and special designs (additional price)

Type	Technical data
..Cos-A-CT NEW	Amercoat painted aluminium housing, resistant against corrosive and/or maritime atmosphere. Cable glands nickel-plated, screws in stainless steel
Ex/RedCos-A-A	Module as before, but with one additional intrinsically safe circuit (0)4…20 mA output to connect external actual value indicator
InCos-A-A	Module as before, but with one additional (0)4…20 mA output to connect external indicator
EXC-RIA-16	Intrinsic safe actual value LCD indicator, for use in zone 1, 2, 21, 22, connectable to ExCos-A-A or RedCos-A-A sensors
NOC-RIA-16	Actual value LCD indicator, for use in safe area, connectable to InCos-A-A sensors
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)

ExLine Ex-transducer with Ex-i circuit for zone 0, 1, 2, 20, 21, 22

Explosion proof

Features EXL-IMU-1

EXL-IMU-1	Module	Description	Basics EXL-IMU-1
Explosion proof zone 0, 1, 2, 20, 21, 22 gas + dust PTB-certified II(1)GD [EEx ia] IIC ATEX 94/9/EC		EXL-IMU-1 module with intrinsically safe circuit to change a passive sensor signal (e.g. Pt 100) into an active mA/VDC signal. **Delivery:** 1 Ex-i module for DIN rail mounting ***Accessory (optional):*** modulating sensors type ExSens	• Transducer for passive, potential free, modulating sensors series ExSens. 2-3-4-wire connection • 24 VAC/DC supply • Output: 0…10 VDC, 4…20 mA • Input: Pt 100/500/1000, Ni 100/200/500/1000, LS-Ni 1000 Siemens, KP 250, LF 20, DFK-.., VFK-.., passive sensors with resistance output 0…1.000 Ohm, 0…10.000 Ohm • Display for adjustment and actual value indication • Module must be installed in the safe area, sensor in the hazardous area

EXL-IMU-1 transducer

Type	Technical data	Installation module	Installation sensor*
EXL-IMU-1	1 module (rail mounting) for 1 passive sensor series ExSens	Safe area	zone 0, 1, 2, 20, 21, 22
Optional:			
N1 supply unit	Input 120…240 VAC, output 24 VDC, max. 0,5 A, max. 4 pcs. EXL-IMU-1 connectable. N1 supply unit is required only in case of 120…240 VAC supply!		

* in acc. with certification of sensor!

ExSens passive modulating sensors for zone 1, 2, 22

Explosion proof

Features modulating ExSens sensors

ExSens	passive	Description	Basics for ExSens sensors
Explosion proof zone 1, 2, 22 gas + dust Manufacturer certificate ATEX 94/9/EC		ExSens sensors for temperature, humidity or pressure measurement in hazardous areas with manufacturer certification in acc. with ATEX 94/9/EC. The sensors are passive and potential free. **Delivery:** 1 Sensor **Ordering example** for 1 room humidity sensor **Type to purchase:** 1 × FFR-2G	• Sensors for installation in hazardous areas, connected to a relevant transducer, e.g. ExCos-A, RedCos-A or EXL-IMU-1 • The transducer changes the passive resistance signal into an acitve 0...10 VDC/4...20 mA signal

Sensors, connectable to ExCos-A, RedCos-A and EXL-IMU-1 transducer

Type	Function	Measuring range	Sensor	Connectable to transducers	Sensor in zone
TFR-2G	Room temperature	-30…+ 60 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2
TFR-2G3D	Room temperature (IP65)	-40…+ 60 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 22
TFK-2G3D	Duct temperature (IP65), 200 mm	-30…+150 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 22
TFK-2G3D-400	Duct temperature, length 400 mm	-30…+150 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 22
TFT-2G3D	Probe temperature (IP65), 100 mm	-30…+150 °C	Pt 100 DIN, tubing G½" Ms	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 22
TFT-V4A-2G3D	Probe temperature (IP65), 100 mm	-30…+150 °C	Pt 100 DIN, tubing G½" VA	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 22
TFM-2G-3	Mean value temperature 3 m	-20…+ 70 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2
TFR-AN-2G3D	Room temperature direct contact	-30…+110 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 22
FFR-2G	Room humidity	30…100 %rF	0…1 kΩ	EXL-IMU-1, ExCos-A, RedCos-A	1, 2
FFK-2G	Duct humidity	30…100 %rF	0…1 kΩ	EXL-IMU-1, ExCos-A, RedCos-A	1, 2
TFFR-2G	Room combination temp./humidity	30…100 %rF, -10…+60 °C	0…1 kΩ, Pt 100	2 × EXL-IMU-1, 2 × ExCos-A, 2 × RedCos-A	1, 2
TFFK-2G	Duct combination temp./humidity	30…100 %rF, -20…+60 °C	0…1 kΩ, Pt 100	2 × EXL-IMU-1, 2 × ExCos-A, 2 × RedCos-A	1, 2
DFK-07-2G-FP	Differential pressure (IP65)	ΔP < 700 Pa	x…y Ω	EXL-IMU-1	1, 2
DFK-17-2G-FP	Differential pressure (IP65)	ΔP < 1700 Pa	x…y Ω	EXL-IMU-1	1, 2
VFK-07-2G-FP	Volume control (IP65)	0…15 m/s	x…y Ω	EXL-IMU-1	1, 2
SGR-2G	Potentiometer	Resistance	0…1 kΩ	EXL-IMU-1, ExCos-A, RedCos-A	1, 2
NEW **ExPro-AT-100**	Duct temperature, length 100 mm	-40…+150 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 21, 22
NEW **ExPro-AT-150**	Duct temperature, length 150 mm	-40…+150 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 21, 22
NEW **ExPro-AT-200**	Duct temperature, length 200 mm	-40…+150 °C	Pt 100 DIN	EXL-IMU-1, ExCos-A, RedCos-A	1, 2, 21, 22

ExBin../RedBin../InBin.. Binary Sensors – Overview and accessories

Overview of the new ExBin.., RedBin.. and InBin.. sensor technology

The new binary sensors are subdevided in 3 installation- and 5 application-areas.

Installation-areas:

ExBin- .....Sensors for Explosion proof zones 1, 2, 21, 22
RedBin- .....Sensors for Explosion proof zones 2, 22
InBin- .....Sensors for safe area (IP66)

Application areas:

Ex/Red/InBin-P .....sensors for pressure and differential pressure monitoring
Ex/Red/InBin-FR .....sensors for frost protection monitoring
Ex/Red/InBin-N.....sensors for drive belt monitoring
Ex/Red/InBin-D + ..Pro-B....active probe sensors for temperature and/or humidity monitoring
Ex/Red/InBin-A + ..Sens ..... passive probe sensors for temperature, humidity, pressure monitoring

The new binary sensor concept grants huge advantages to known solutions, especially in hazardous areas:

1. No intrinsically safe wiring required between the control panel and the sensor
2. No intrinsically safe circuit necessary inside the control panel
3. No transducer needed in the electrical control panel
4. Reduced installation cost
5. Easy parameterisation
6. 1-and 2-stage versions available

ΔP ExBin-P

Pressure, differential pressure (Filter/Fan belt monitoring) – binary, active

ExBin-P.., RedBin-P.., InBin-P..

Binary pressure/differential pressure auxilliary switch 0...500 or 0...5.000 Pa, for direct connection of air hoses. IP66 aluminium die-casting housing with integrated terminal box. Measurement range adjustable on site, output 1 potential-free make contact. Integrated indication of actual value, illuminated. 2-stage version optionally available.

°C ExBin-FR

Frost protection thermostats – binary, active

ExBin-FR.., RedBin-FR.., InBin-FR..

Frost protection thermostat mechanically adjustable and switching. Setting range -10...+15 °C. 3 or 6 m capillary as sensor with a resolution of 40 cm effective range. Switching status display with LED. IP66 Aluminium die-cast housing with integrated terminal box. Output 1 potential-free make contact.

U^{min} ExBin-N

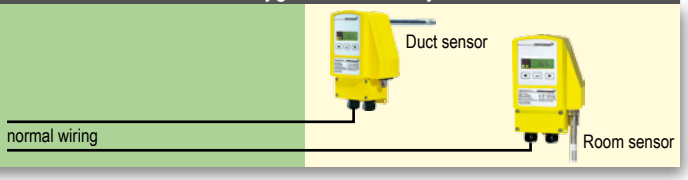
Drive belt monitoring via speed control – binary, activ

ExBin-N.., RedBin-N.., InBin-N..

Binary, contactless fan belt monitoring by inductive speed control. Measurement range 0..10.000 min^{-1}, Setting range 50...10.000 min^{-1}, incl. time switch relais and indication of actual value. IP66 Aluminium die-cast housing with integrated terminal box. Output 1 potential-free make contact. 2-stage version available optional.

°C %rH ExBin-D + ExPro-B..

Thermostats, hygrostats – binary, activ

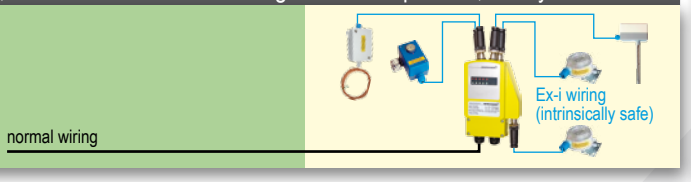


ExBin-D.., RedBin-D.., InBin-D.. + ExPro-B.. respectively InPro-B... Sensor probes

Thermostats and/or hygrostats for connection of one ExPro-B.. respectively InPro-B.. sensor probe. Operating range adjustable. Indication of actual value. IP66 Aluminium die-cast housing with integrated terminal box. Output 1 potential-free make contact. 2-stage version optionally available.

°C %rH ΔP ExBin-A + ExSens

1-, 2- or 5-channel Ex-switching module for passive, binary sensors

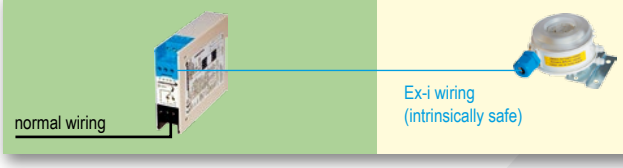


ExBin-A1/A2/A5, RedBin-A1/A2/A5 + ExSens sensors binary

1-, 2- or 5-channel Ex-switching module for connection of max. 5 passive, potential-free binary sensors. Switching status display with LED. IP66 Aluminium die-cast housing with integrated terminal box. Output depending on type 1-5 make contacts with collective supply unit.

°C %rH ΔP EXL-IRU-1 + ExSens

Temperature, humidity, differential pressure – binary, passive



EXL-IRU-1 switching module + ExSens sensor

Ex-switching module for connection of one passive, binary ExSens sensor, such as differential pressure switch, frost protection thermostat or hygrostat through intrinsically safe electrical conduit. Installation in control box onto DIN-rail. Output is potential-free.

Safe area | **Ex area**

ExBin-P / RedBin-P / InBin-P Pressure / differential pressure switch, binary

Explosion proof

ExBin-P...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2(1)G Ex emb [ia] IIC T6
II2(1)D Ex tD A21 [iaD] IP66 T80°C
ATEX 94/9/EC

RedBin-P...

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3(1)G Ex nC [ia] IIC T6
II3(1)D Ex tD A22 [iaD] IP66 T80°C
ATEX 94/9/EC

Industrial

InBin-P...

InBin-P.. sensors are
NOT Explosion proof
and only for
use in safe area
IP66

Features of ExBin-P, RedBin-P, InBin-P sensors

Description

ExBin-P, RedBin-P and InBin-P are pressure switches for HVAC systems, e.g. for differential pressure control for filter- or fan belt monitoring.

Delivery:
1 Pressure switch with integrated terminal box.

Recommended accessory:
Installation kit 2

Basics for all ...Bin-P sensors

- No additional module in the panel required!
- No intrinsically safe wiring required!
- 24 VAC / DC supply
- 1-channel: 1 potential-free contact
- 2-channel (optional): 2 potential-free contacts
- Switch-point is digitally adjustable
- Indication of actual value (can be switched off)
- Switching status display over LED
- All parameters can be adjusted on site without additional tools and measurement devices
- Aluminium housing IP66 with integrated terminal box
- Dimensions (H × W × D) 180 × 107 × 66 mm

ExBin-P... Differential pressure switch for zone 1, 2, 21, 22

Type	Measurement range	Safe overload	Setting range	Installation module
ExBin-P-500	0 ... 500 Pa	up to 5.000 Pa	1-stage adjustable switch-point in measurement range	zone 1, 2, 21, 22
ExBin-P-500-2	0 ... 500 Pa	up to 5.000 Pa	2-stage adjustable switch-point in measurement range	zone 1, 2, 21, 22
ExBin-P-5000	0 ... 5.000 Pa	up to 50.000 Pa	1-stage adjustable switch-point in measurement range	zone 1, 2, 21, 22
ExBin-P-5000-2	0 ... 5.000 Pa	up to 50.000 Pa	2-stage adjustable switch-point in measurement range	zone 1, 2, 21, 22

RedBin-P... Differential pressure switch for zone 2, 22

Type	Measurement range	Safe overload	Setting range	Installation module
RedBin-P-500	0 ... 500 Pa	up to 5.000 Pa	1-stage adjustable switch-point in measurement range	zone 2, 22
RedBin-P-500-2	0 ... 500 Pa	up to 5.000 Pa	2-stage adjustable switch-point in measurement range	zone 2, 22
RedBin-P-5000	0 ... 5.000 Pa	up to 50.000 Pa	1-stage adjustable switch-point in measurement range	zone 2, 22
RedBin-P-5000-2	0 ... 5.000 Pa	up to 50.000 Pa	2-stage adjustable switch-point in measurement range	zone 2, 22

InBin-P... Differential pressure switch for safe area

Type	Measurement range	Safe overload	Setting range	Installation module
InBin-P-500	0 ... 500 Pa	up to 5.000 Pa	1-stage adjustable switch-point in measurement range	safe area
InBin-P-500-2	0 ... 500 Pa	up to 5.000 Pa	2-stage adjustable switch-point in measurement range	safe area
InBin-P-5000	0 ... 5.000 Pa	up to 50.000 Pa	1-stage adjustable switch-point in measurement range	safe area
InBin-P-5000-2	0 ... 5.000 Pa	up to 50.000 Pa	2-stage adjustable switch-point in measurement range	safe area

Accessories and special designs (additional price)

Type	Technical data
NEW ..Bin-P..-CT	Amercoat painted aluminium housing, resistant against corrosive and / or maritime atmosphere. Cable glands nickel-plated, screws in stainless steel
NEW ..Bin-P..-OCT	Offshore version with seawater resistant Amercoat painted aluminium housing. M20 cable glands nickel-plated, pressure connection tubes and screws in stainless steel
Installation kit 2	Includes 2 meter pressure hose (inner diameter 6 mm) and 2 plastic fittings
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)

Pressure, differential pressure (Filter / Fan belt monitoring) – binary, active

Safe area | **Ex area**

ExBin-FR / RedBin-FR / InBin-FR Frost protection thermostats

Explosion proof | Industrial | Features ExBin-FR, RedBin-FR, InBin-FR frost protection thermostats

ExBin-FR...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2(1)G Ex emb [ia] IIC T6
II2(1)D Ex tD A21 [iaD] IP66 T80°C
ATEX 94/9/EC

RedBin-FR...

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3(1)G Ex nC [ia] IIC T6
II3(1)D Ex tD A22 [iaD] IP66 T80°C
ATEX 94/9/EC

InBin-FR...

InBin-FR.. sensors are
NOT Explosion proof
and only for
use in safe area
IP66

Description

ExBin-FR, RedBin-FR and InBin-FR are frost protection thermostats for HVAC systems, e.g. for frost protection monitoring of heating registers / heat exchangers.

Delivery:
1 Frost protection thermostat with integrated terminal box, with 3 m or 6 m capillary (depending on type).

Recommended accessory:
for ..Bin-FR3: Installation kit 1.3
for ..Bin-FR6: Installation kit 1.6

Basics for all ...Bin-FR sensors

- No additional module in the panel required!
- No intrinsically safe wiring required!
- 24 VAC/DC supply
- Temperature sensoring by capillary with 3 m or 6 m length (depending on type)
- Min. reaction length of capillary ~ 40 cm
- 1 potential-free contact
- Switch-point is mechanically adjustable
- Switching status display with LED
- Aluminium housing IP66 with integrated terminal box
- Dimensions (H × W × D) 180 × 107 × 66 mm

ExBin-FR... frost protection thermostats for zone 1, 2, 21, 22

Type	Capillary	Temperature range	Setting range	Installation module
ExBin-FR-3	3 m	-10 ... +15 °C	1-stage adjustable switch-point in temperature range	zone 1, 2, 21, 22
ExBin-FR-6	6 m	-10 ... +15 °C	1-stage adjustable switch-point in temperature range	zone 1, 2, 21, 22

RedBin-FR... frost protection thermostats for zone 2, 22

Type	Capillary	Temperature range	Setting range	Installation module
RedBin-FR-3	3 m	-10 ... +15 °C	1-stage adjustable switch-point in temperature range	zone 2, 22
RedBin-FR-6	6 m	-10 ... +15 °C	1-stage adjustable switch-point in temperature range	zone 2, 22

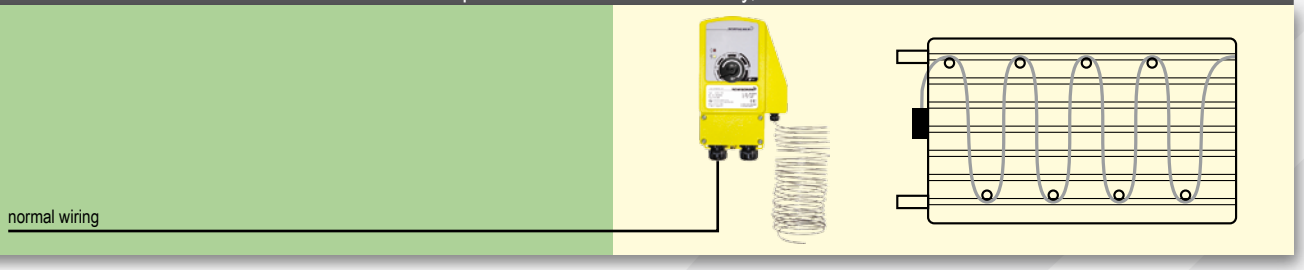
InBin-FR... frost protection thermostats for secure area

Type	Capillary	Temperature range	Setting range	Installation module
InBin-FR-3	3 m	-10 ... +15 °C	1-stage adjustable switch-point in temperature range	safe area
InBin-FR-6	6 m	-10 ... +15 °C	1-stage adjustable switch-point in temperature range	safe area

Accessories and special designs (additional price)

Type	Technical data
..Bin-FR..-CT NEW	Amercoat painted aluminium housing, resistant against corrosive and / or maritime atmosphere. Cable glands nickel-plated, screws in stainless steel
Installation kit 1.3	Capillary duct, assembly cramp and 4 assembly brackets for frost protection thermostat ..Bin-FR3
Installation kit 1.6	Capillary duct, assembly cramp and 8 assembly brackets for frost protection thermostat ..Bin-FR6
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)

Frost protection thermostat – binary, active



Safe area | Ex area

ExBin-N / RedBin-N / InBin-N Fan belt monitoring via speed control

Explosion proof

ExBin-N...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2(1)G Ex emb [ia] IIC T6
II2(1)D Ex tD A21 [iaD] IP66 T80°C
ATEX 94/9/EC

RedBin-N...

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3(1)G Ex nC [ia] IIC T6
II3(1)D Ex tD A22 [iaD] IP66 T80°C
ATEX 94/9/EC

Industrial

InBin-N...

InBin-N.. sensors are
NOT Explosion proof
and only for
use in safe area
IP66

Features of ExBin-N, RedBin-N, InBin-N fan belt monitoring modules

Description

ExBin-N, RedBin-N und InBin-N are fan belt monitoring modules for HVAC systems, via speed control of fan drive shaft.

Delivery:
1 Fan belt monitoring modul with integrated terminal box and provided, directly mountable Namur transducer.

Recommended accessory:
Dependend on air power and dimensions of ventilator / propeller a mounting console is required.
The indicated values in m³ / h are empirical values – they can vary depending on the construction of ventilator / propeller.

Basics for all ...Bin-N sensors

- No additional module in the panel required!
- No intrinsically safe wiring required!
- 24 VAC/DC supply
- Measurement of number of revolutions in min^{-1}
- Switch-point in min^{-1} is digitally adjustable
- Integrated, adjustable time switch relais
- 1-channel: 1 potential-free contact
- 2-channel (optional): 2 potential-free contacts
- Display with indication of actual value
- Switching status display with LED
- Aluminium housing IP66 with integrated terminal box
- Dimensions (H × W × D) 180 × 107 × 66 mm
- Namur transducer included in delivery

ExBin-N.. fan belt monitoring modules via speed control for zone 1, 2, 21, 22

Type	Sensor	Speed control range	Setting range	Installation module
ExBin-N	Namur transducer, inductive, DIN 19234	0 ... 10.000 min^{-1}	1-stage adjustable switch-point from 50...10.000 min^{-1}	zone 1, 2, 21, 22
ExBin-N-2	Namur transducer, inductive, DIN 19234	0 ... 10.000 min^{-1}	2-stage adjustable switch-point from 50...10.000 min^{-1}	zone 1, 2, 21, 22

RedBin-N.. fan belt monitoring modules via speed control for zone 2, 22

Type	Sensor	Speed control range	Setting range	Installation module
RedBin-N	Namur transducer, inductive, DIN 19234	0 ... 10.000 min^{-1}	1-stage adjustable switch-point from 50...10.000 min^{-1}	zone 2, 22
RedBin-N-2	Namur transducer, inductive, DIN 19234	0 ... 10.000 min^{-1}	2-stage adjustable switch-point from 50...10.000 min^{-1}	zone 2, 22

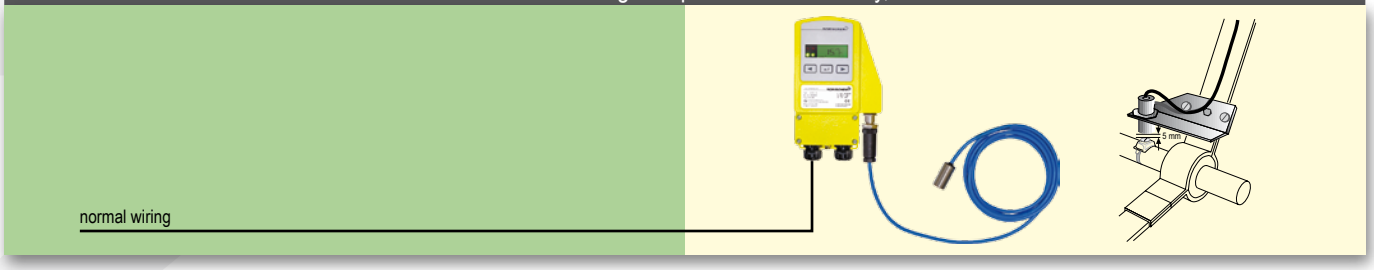
InBin-N.. fan belt monitoring modules via speed control for safe area

Type	Sensor	Speed control range	Setting range	Installation module
InBin-N	Namur transducer, inductive, DIN 19234	0 ... 10.000 min^{-1}	1-stage adjustable switch-point from 50...10.000 min^{-1}	safe area
InBin-N-2	Namur transducer, inductive, DIN 19234	0 ... 10.000 min^{-1}	2-stage adjustable switch-point from 50...10.000 min^{-1}	safe area

Accessories and special designs (additional price)

Type	Technical data
NEW ..Bin-N..-CT	Amercoat painted aluminium housing, resistant against corrosive and / or maritime atmosphere. Cable glands nickel-plated, screws in stainless steel
Installation kit 3	Mounting set for Namur transducer onto ventilators / propellers *up to* approx. 20.000 m³ / h
Installation kit 4	Mounting set for Namur transducer onto ventilators / propellers *over* approx. 20.000 m³ / h
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)

Drive belt monitoring via speed control – binary, activ



Safe area | **Ex area**

ExBin-D / RedBin-D / InBin-D Thermostats, hygrostats

Explosion proof

ExBin-D...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2(1)G Ex emb [ia] IIC T6
II2(1)D Ex tD A21 [iaD] IP66 T80°C
ATEX 94/9/EC

RedBin-D...

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3(1)G Ex nC [ia] IIC T6
II3(1)D Ex tD A22 [iaD] IP66 T80°C
ATEX 94/9/EC

Industrial

InBin-D...

InBin-D.. sensors are
NOT Explosion proof
and only for
use in secure area
IP66

Features of ExBin-D, RedBin-D, InBin-D thermostats, hygrostats

Description

ExBin-D, RedBin-D and InBin-D modules are used together with ExPro-B… / InPro-B… sensor probes as thermostats or hygrostats in HVAC systems.

Delivery: 1 Ex / Red / InBin.. module with socket for 1 ExPro-B… / InPro-B… sensor

Required accessory (additional price):
ExPro-B… or InPro-B… sensor

Ordering example for one thermostat in an air duct, 150 mm sensor length, with sensor in Ex zone 21.
Types to order:
1 × ExBin-D
1 × ExPro-BT150 (Ex-i sensor probe)

Basics for all …Bin-D sensors

- No additional module in the panel required!
- No intrinsically safe wiring required!
- 24 VAC/DC supply
- Socket for ExPro-B… sensor
- Selectable on site if used for room or duct application
- Switch-point for °C and %rH separately adjustable (dependend on sensor probe type)
- 1-channel: 2 pot.-free contacts (1 × °C, 1 × %rH)
- 2-channel: 4 pot.-free contacts (2 × °C, 2 × %rH)
- Display with indication of actual value
- Switching status display with LED
- Aluminium housing IP66 with integrated terminal box
- Dimensions (H × W × D) 180 × 107 × 66 mm

ExBin-D thermostats and / or hygrostats, dependend on sensor probe type ExPro-B… (p. 25) for zone 1, 2, 21, 22

Type	Technical data	Installation module	Installation ExPro-B.. sensor
ExBin-D	Module for connection of one ExPro-B… sensor as thermostat and / or hygrostat, 1-stage	zone 1, 2, 21, 22	zone 1, 2, 21, 22
ExBin-D-2	Module for connection of one ExPro-B… sensor as thermostat and / or hygrostat, 2-stage	zone 1, 2, 21, 22	zone 1, 2, 21, 22

RedBin-D thermostats and / or hygrostats, dependend on sensor probe type ExPro-B… (p. 25) for zone 2, 22

Type	Technical data	Installation module	Installation ExPro-B.. sensor
RedBin-D	Module for connection of one ExPro-B… sensor as thermostat and / or hygrostat, 1-stage	zone 2, 22	zone 1, 2, 21, 22
RedBin-D-2	Module for connection of one ExPro-B… sensor as thermostat and / or hygrostat, 2-stage	zone 2, 22	zone 1, 2, 21, 22

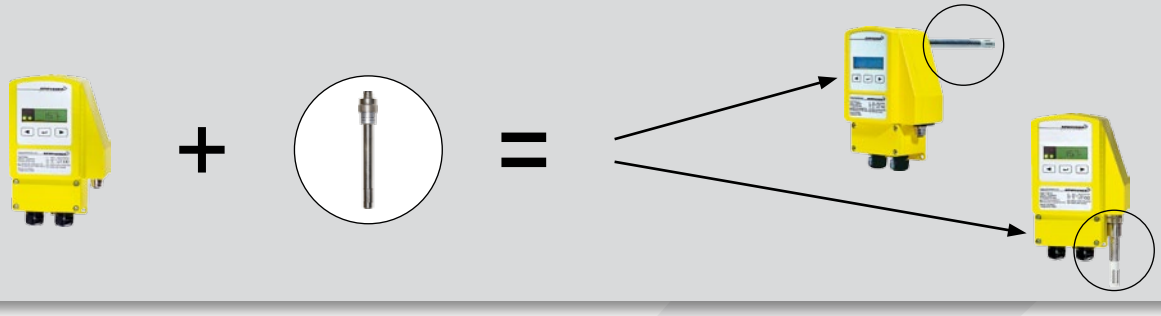
InBin-D thermostats and / or hygrostats, dependend on sensor probe type InPro-B… (p. 25) for safe area

Type	Technical data	Installation module	Installation InPro-B.. sensor
InBin-D	Module for connection of one InPro-B… sensor as thermostat and / or hygrostat, 1-stage	safe area	safe area
InBin-D-2	Module for connection of one InPro-B… sensor as thermostat and / or hygrostat, 2-stage	safe area	safe area

Accessories and special designs (additional price)

Type	Technical data
..Bin-D..-CT NEW	Amercoat painted aluminium housing, resistant against corrosive and / or maritime atmosphere. Cable glands nickel-plated, screws in stainless steel
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)

Example of combinations



ExPro-B…/InPro-B… Digital thermostat/hygrostat sensor probes

Explosion proof | Industrial | Features of ExPro-B.., InPro-B.. sensors

ExPro-B...

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified in acc.
with ExBin-D..
and RedBin-D..
transducer
ATEX 94/9/EC

InPro-B...

InPro-B... sensors
only for use with
InBin-D..
transducer!
NOT for use in
Ex area!

Description

ExPro-B… sensors are used for measurements of temperature and/or humidity in hazardous areas, for **exclusive** use with ExBin-D… / RedBin-D… modules!

InPro-B… sensors are suitable for temperature and/or humidity measurement in safe areas, for **exclusive** use with InBin-D… modules!

Delivery: 1 sensor with connector
Example: room-humidity sensor, 50 mm length
Type: 1 × ExPro-BF-50
Attention: only in combination with:
1 × ExBin-D or RedBin-D
(InBin-D… by InPro-B… sensors)

Basics for all ExPro-B…/InPro-B… sensors

- Sensors for connection to ExBin-D…, RedBin-D… modules. Adaptation via connector
- ExPro-B…/InPro-B… sensors can be optionally screwed to the housing at the back (duct measurement) or bottom (room measurement)
- When using humidity-sensors, the contamination and aggressiveness of the medium has to be regarded

Sensor probes for ExBin-D and RedBin-D modules

Type	Function	Measurement range	Sensor length	Main use	Connectable to		Installation area
ExPro-BT - 50	Thermostat	- 40…+ 80 °C	50 mm	Room/Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BT -100	Thermostat	- 40…+ 125 °C	100 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BT -150	Thermostat	- 40…+ 125 °C	150 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BT -200	Thermostat	- 40…+ 125 °C	200 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BF - 50	Hygrostat	0…100 %rH	50 mm	Room/Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BF -100	Hygrostat	0…100 %rH	100 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BF -150	Hygrostat	0…100 %rH	150 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BF -200	Hygrostat	0…100 %rH	200 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BTF- 50	Combination Thermostat/Hygrostat	- 40…+ 80 °C, 0…100 %rH	50 mm	Room/Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BTF-100	Combination Thermostat/Hygrostat	- 40…+ 125 °C, 0…100 %rH	100 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BTF-150	Combination Thermostat/Hygrostat	- 40…+ 125 °C, 0…100 %rH	150 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22
ExPro-BTF-200	Combination Thermostat/Hygrostat	- 40…+ 125 °C, 0…100 %rH	200 mm	Duct	ExBin-D	RedBin-D	zone 1, 2, 21, 22

Sensor probes for InBin-D modules

Type	Function	Measurement range	Sensor length	Main use	Connectable to	Installation area
InPro-BT - 50	Thermostat	- 40…+ 80 °C	50 mm	Room/Duct	InBin-D	safe area
InPro-BT -100	Thermostat	- 40…+ 125 °C	100 mm	Duct	InBin-D	safe area
InPro-BT -150	Thermostat	- 40…+ 125 °C	150 mm	Duct	InBin-D	safe area
InPro-BT -200	Thermostat	- 40…+ 125 °C	200 mm	Duct	InBin-D	safe area
InPro-BF - 50	Hygrostat	0…100 %rH	50 mm	Room/Duct	InBin-D	safe area
InPro-BF -100	Hygrostat	0…100 %rH	100 mm	Duct	InBin-D	safe area
InPro-BF -150	Hygrostat	0…100 %rH	150 mm	Duct	InBin-D	safe area
InPro-BF -200	Hygrostat	0…100 %rH	200 mm	Duct	InBin-D	safe area
InPro-BTF- 50	Combination Thermostat/Hygrostat	- 40…+ 80 °C, 0…100 %rH	50 mm	Room/Duct	InBin-D	safe area
InPro-BTF-100	Combination Thermostat/Hygrostat	- 40…+ 125 °C, 0…100 %rH	100 mm	Duct	InBin-D	safe area
InPro-BTF-150	Combination Thermostat/Hygrostat	- 40…+ 125 °C, 0…100 %rH	150 mm	Duct	InBin-D	safe area
InPro-BTF-200	Combination Thermostat/Hygrostat	- 40…+ 125 °C, 0…100 %rH	200 mm	Duct	InBin-D	safe area

Accessories (additional price)

Type	Technical data
MFK	Mounting flange for duct-installation, for variable depth of immersion in the air duct
TH-VA	Probe made of stainless-steel V4A 1.4571, length 120 mm. Other lengths on request
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)

ExBin-A / RedBin-A / InBin-A Switching modules

Explosion proof

ExBin-A

Explosion proof
zone 1, 2, 21, 22
gas + dust
PTB-certified
II2(1)G Ex emb [ia] IIC T6
II2(1)D Ex tD A21 [iaD] IP66 T80°C
ATEX 94/9/EC

RedBin-A

Explosion proof
zone 2, 22
gas + dust
PTB-certified
II3(1)G Ex nC [ia] IIC T6
II3(1)D Ex tD A22 [iaD] IP66 T80°C
ATEX 94/9/EC

Industrial

InBin-A

InBin-A.. sensors are
NOT Explosion proof
and only for use
in safe area
IP66

Features of ExBin-A, RedBin-A, InBin-A modules

Description

ExBin-A, RedBin-A and InBin-A modules are switching modules for direct mounting in Ex areas (except InBin-A) with 1, 2 or 5 channels, for connection of 1, 2 or 5 passive potential-free binary sensors, for use in HVAC systems.

Delivery: 1 module with socket for 1 up to 5 ExSens sensors (dependent on type)

Accessory (optional): Binary sensors series ExSens, see next page

Basics for all …Bin-A modules

- No additional module in the panel required!
- No intrinsically safe wiring required!
- Mounting of module directly in Ex area
- 24 VAC/DC supply
- 1 up to 5 passive, potential-free, binary sensors
- Sockets for 1 up to 5 ExSens sensors
- 1 up to 5 contacts with common supply unit
- 1 or 2 contacts with additional clamp for time switch relais, e.g. for 2 fan belt monitoring applications (time 120 sec.)
- Display with indication of actual value
- Switching status display with LED
- Aluminium housing IP66 with integrated terminal box
- Dimensions (H × W × D) 180 × 107 × 66 mm

ExBin-A.. Switching modules for 1 up to 5 passive binary sensors for zone 1, 2, 21, 22

Type	Technical data	Installation module	Installation sensor*
ExBin-A-1	Module (1 channel) to connect 1 binary ExSens sensor in Ex area	zone 1, 2, 21, 22	zone 0, 1, 2, 20, 21, 22
ExBin-A-2	Module (2 channel) to connect 2 binary ExSens sensors in Ex area	zone 1, 2, 21, 22	zone 0, 1, 2, 20, 21, 22
ExBin-A-5	Module (5 channel) to connect 5 binary ExSens sensors in Ex area	zone 1, 2, 21, 22	zone 0, 1, 2, 20, 21, 22

* in acc. with certification of sensor!

RedBin-A.. Switching modules for 1 up to 5 passive binary sensors for zone 2, 22

Type	Technical data	Installation module	Installation sensor*
RedBin-A-1	Module (1 channel) to connect 1 binary ExSens sensor in Ex area	zone 2, 22	zone 0, 1, 2, 20, 21, 22
RedBin-A-2	Module (2 channel) to connect 2 binary ExSens sensor in Ex area	zone 2, 22	zone 0, 1, 2, 20, 21, 22
RedBin-A-5	Module (5 channel) to connect 5 binary ExSens sensor in Ex area	zone 2, 22	zone 0, 1, 2, 20, 21, 22

* in acc. with certification of sensor!

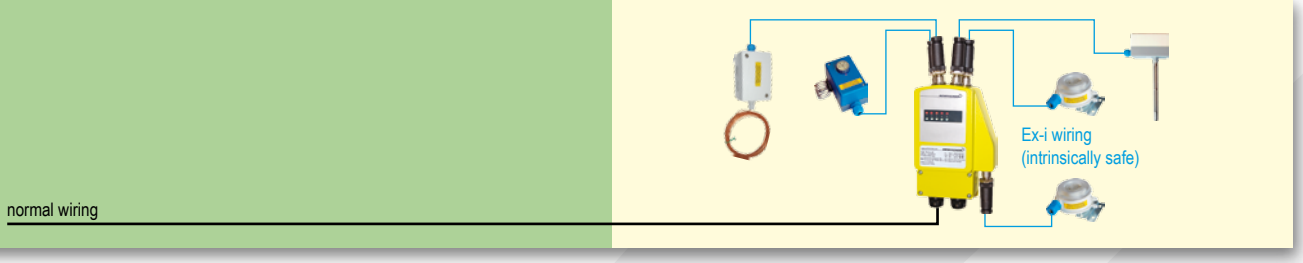
InBin-A.. Switching modules for 1 up to 5 passive binary sensors for safe area

Type	Technical data	Installation module	Installation sensor
InBin-A-1	Module (1 channel) to connect 1 binary sensor	safe area	safe area
InBin-A-2	Module (2 channel) to connect 2 binary sensors	safe area	safe area
InBin-A-5	Module (5 channel) to connect 5 binary sensors	safe area	safe area

Accessories and special designs (additional price)

Type	Technical data
..Bin-A..-CT NEW	Amercoat painted aluminium housing, resistant against corrosive and/or maritime atmosphere. Cable glands nickel-plated, screws in stainless steel
MKR	Mounting bracket for installation on round air-ducts (diameter up to 600 mm)

1, 2 or 5-channel switching module for passive binary sensors



ExLine Ex-switching module for potential free, binary signals in zone 0, 1, 2, 20, 21, 22

Explosion proof

EXL-IRU-1
Explosion proof
zone 0, 1, 2, 20, 21, 22
gas + dust
PTB-certified
II(1)GD [EEx ia] IIC
ATEX 94/9/EC

EXL-IRU-1

Features EXL-IRU-1 module

Description

EXL-IRU-1 module with intrinsically safe circuit to change a passive potential free binary signal (e.g. contact) into a contact in the safe area.

Delivery:
1 Ex-i module for DIN rail mounting

Accessory (optional):
binary sensors type ExSens

Basics EXL-IRU-1

- 24 VAC/DC supply
- Input: passive potential free binary sensor
- Output: potential free contact in the safe area
- Integrated time running relais 30...120 sec.
- 2 LED to show switching position
- DIN rail mounting
- Module must be installed in the safe area, sensor in the hazardous area

EXL-IRU-1 switching module

Type	Technical data	Installation module	Installation sensor*
EXL-IRU-1	1 module (rail mounting) for 1 passive binary sensor series ExSens	Safe area	zone 0, 1, 2, 20, 21, 22
Optional:			
N1 supply unit	Input 120…240 VAC, output 24 VDC, max. 0,5 A, max. 4 pcs. EXL-IRU-1 connectable. N1 supply unit is required only in case of 120…240 VAC supply!		

* in acc. with certification of sensor!

ExSens passive binary sensors for zone 1, 2, 22

Explosion proof

ExSens
Explosion proof
zone 1, 2, 22
gas + dust
Manufacturer
certification
ATEX 94/9/EC

binary passive

Features ExSens sensors

Description

ExSens binary sensors for temperature, humidity or pressure measurement in hazardous areas with manufacturer certification in acc. with ATEX 94/9/EC. The sensors are passive and potential free.

Delivery: 1 Sensor
Ordering example for 1 frost protection thermostat
Type to purchase: 1 × TBK-FR-2G

Basics for binary ExSens sensors

- Sensors for installation in hazardous areas, connected to a switching module type ExBin-A, RedBin-A or EXL-IRU-1
- The module changes the passive binary signal into a contact in the safe area
- Sensor must be installed in the hazardous area, module in the safe area

Sensors, connectable to switching modules type ExBin-A, RedBin-A and EXL-IRU-1

Type	Function	Range	Sensor	Information	Connectable to module type	Sensor in zone
TBR-2G	Room thermostat	0…+40 °C, 1 K	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2
TBR-2G3D	Room thermostat (IP65)	-35…+30 °C, 2-20 K	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2, 22
TBR-2-2G	Room thermostat 2 stage	0…+60 °C, 1 K	2 × Contact, 2-pos		2 × EXL-IRU-1, ExBin-A, RedBin-A	1, 2
TBR-AN-2G	Room temperature direct contact	0…+60 °C, 5 ± 1 K (fix)	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2
TBK-2G	Duct thermostat (IP65)	0…+65 °C, 2-20 K	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2
TBT-2G	Probe thermostat (IP54)	0…+90 °C, 3 K	Contact, 2-pos	L = 120 mm	EXL-IRU-1, ExBin-A, RedBin-A	1, 2
TBT-VA-2G	Probe thermostat with VA sleeve	0…+90 °C, 3 K	Contact, 2-pos	V4A	EXL-IRU-1, ExBin-A, RedBin-A	1, 2
TBK-FR-2G	Frost protection thermostat (IP65)	-10…+12 °C	Contact, 2-pos	capillary 6 m	EXL-IRU-1, ExBin-A, RedBin-A	1, 2
FBR-2G	Room hygrostat	35…100 %rH, ~ 4 %rH	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2
FBK-2G	Duct hygrostat	35…100 %rH, ~ 4 %rH	Contact, 2-pos	L = 180 mm	EXL-IRU-1, ExBin-A, RedBin-A	1, 2
DBK-2G	Differential pressure	20-300, 50-500, 100-1.000 Pa	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2
DBK-2G3D	Differential pressure (IP65)	40-125, 100-400, 350-1.400 Pa	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2, 22
WFBK-2G	Air paddle	2…8 m/s, paddle V2A	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2
SWBT-2G	liquid flow switch	-20…+60 °C	Contact, 2-pos		EXL-IRU-1, ExBin-A, RedBin-A	1, 2
NBW-K-2G	Fan belt protection (IP65)	up to < 20.000 m³/h	Namur sensor + bracket		EXL-IRU-1, ExBin-A, RedBin-A	1, 2
NBW-G-2G	Fan belt protection (IP65)	more than > 20.000 m³/h	Namur sensor + bracket		EXL-IRU-1, ExBin-A, RedBin-A	1, 2

Accessories (additional price)

Type	Technical data
Installation kit 1	for frost protection sensor type TBK-FR-2G, PG entries for capillary, 6 brackets, support bracket
Install.kit 2-DBK	includes 2 meter pressure hose (inner diameter Ø 6 mm) 2 plastic fittings

ExMag Ex-doorholder magnets for zone 1, 2, 21, 22

Explosion proof

Features ExMag magnets

ExMag	Magnet	Description	Basics ExMag
Explosion proof zone 1, 2, 21, 22 gas + dust PTB-certified II2G Ex mb II T6 II2D Ex tD 21IP65 T80°C ATEX 94/9/EC		ExMag doorholder magnets are electric magnets to keep doors open or closed as long as supply voltage is available. **Delivery:** 1 magnet + accessories **Ordering example:** 650 N magnet + anchor + Ex-terminal box **Type to purchase:** 1 × EXM-650 + 1 GH 6 + 1 × EXC-K4/S	• ExMag electric magnets. Force in acc. with type • 1 m cable • An Ex-e terminal box is required for electrical connection. We recommend a stabilised 24 VDC power supply • The max. AC-ripple must not exceed 20%

ExMag magnets

Type	Force	Supply	Function	Current	Installation in
EXM-650	650 N	24 VDC	Magnet	44 mA	Zone 1, 2, 21, 22
EXM-1300	1.300 N	24 VDC	Magnet	65 mA	Zone 1, 2, 21, 22
EXM-2000	2.000 N	24 VDC	Magnet	160 mA	Zone 1, 2, 21, 22

Accessories (additional price)

Type	Technical data
GH-6	Anchor for EXM-650
GH-13/20	Anchor for EXM-1300 and EXM-2000
ExBox-3P	Ex-e terminal box, IP66
EXC-K4/S	Ex-e terminal box, IP66, with integrated fuse
EXC-T1	Ex-d push button
N1 supply unit	Input 120…240 VAC, output 24 VDC, max. 0,5 A

ExComp different Ex-components

Explosion proof

Features ExComp components

ExComp	Components	Description	Basics ExComp
Explosion proof zone 1, 2, 21, 22 (in acc. to type) gas + dust PTB-certified ATEX 94/9/EC		Different explosion proof products like switches, frost protection thermostats, ... **Delivery:** 1 component **Ordering example:** Switch 20 A, 6 pole **Type to purchase:** 1 × EXC-R 20/6	• No specific information • Data in acc. with every single product/type

ExComp components

Type	Application	Explosion proof	Technical data
EXC-T...	Thermostat	II2G EEx ed IIC T6	-30…+70 °C, different ranges and types
EXC-TF...	Frost protection thermostat	II2G EEx ed IIC T6	+4…+ 15 °C, ΔT = 2K, capillary 6 m
EXC-R 10/3...	Switch	II2G EEx ed IIC T6	10 A - 240/400 V - 2,5/4,6 KW - 3 pole
EXC-R 20/3...	Switch	II2G EEx ed IIC T6	20 A - 240/400 V - 4,5/9,0 KW - 3 pole
EXC-R 20/6...	Switch	II2G EEx ed IIC T6	20 A - 240/400 V - 4,5/9,0 KW - 6 pole
EXC-R 40/3...	Switch	II2G EEx ed IIC T6	40 A - 240/400 V - 11/20 KW - 3 pole
EXC-R 40/6...	Switch	II2G EEx ed IIC T6	40 A - 240/400 V - 11/20 KW - 6 pole
EXC-R 80/3...	Switch	II2G EEx ed IIC T6	80 A - 240/400 V - 23/40 KW - 3 pole
EXC-R 80/6...	Switch	II2G EEx ed IIC T6	80 A - 240/400 V - 23/40 KW - 6 pole
EXC-RIA-16	Actual value indication	II2G EEx ia IIC T6	4...20 mA, loop powered
EXC-...	Smoke detector, duct/room	II2G EEx m II T4	24 VDC, incl. terminal box
EXC-DS1/VA	Safety temperature sensor	II2G EEx d IIC T6	Duct mounting, potential free contact, switching at 70°C…160°C (10°C steps)

Notices

Information about electrical explosionproof according ATEX 94/9/EC

Regulations for explosion protection

Explosion protection regulations in the EU member states are marked by the change of EU protection guideline 67/117/EWG ff to the two new EU guidelines 94/9/EC (ATEX 95) and 95/C 332/06 (ATEX 137). As a result of the new directives, explosion protection in European regulations there will be a harmonisation of standards. There will be a transitional period to adjust from the „old“ to the „new“ European law. The regulations covering the „old” law were in effect up to June 30th 2003.
Since July 1st 2003, electric explosion proof equipment must comply with ATEX Ex-protection guidelines in accordance with 94/9/EC – on the approximation of the laws of the Member States concerning equipment and protective systems for use in potentially explosive atmospheres.
Information on uniform classification of potentially explosive systems and how to use this as a basis for selecting and classifying systems and equipment, incl. their installation, can be found in guideline 1999/92/EC (ATEX 137).
ATEX: Guideline 94/9/EC of the European parliament and the Council from March 23rd 1994 brought the legislation of the member states, concerning equipment and protective systems for use in explosion risk areas, into line.
ExVO: Directive on the distribution of equipment and protection systems for potentially explosive areas – explosion protection prescription - 11.GSGV.
ElexV: Operational Safety regulation, minimum regulation in order to improve health-safety and security of employees at hazardous workplaces!

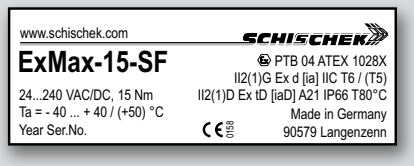
Certificates
Corresponding approvals and certificates are required for electrical explosion proof equipment. Testing must be carried out by an official testing agency (for example the PTB - Physikalisch Technische Bundesanstalt in Braunschweig/Federal German Physical and Technical Institute of Braunschweig). ATEX approvals are also accepted in many countries and states outside Europe.

Responsibilities
The responsibility for compliance with all regulations and guidelines, from production to planning, up until installation, operation and maintenance, has greatly increased
Each individual must be conscious about the fact that he accepts personal responsibility as part of a total project:
- building owner
- end-user
- architect
- consulting engineer/control company
- inspection authority
- contractor/installer
- manufacturer
- product supplier
- maintenance engineers

The type plate and its components

The type plate and its components
From 1/7/2003 the new ATEX guidelines come into force. The then current legal bases for the certification and labelling of electric explosion proof equipment is the EC guideline:

Example, for the labelling of a quarter turn actuator:
Manufacturer's name, manufacturer's address, designation of type, electrical data (V, A, W, Hz) ambient temperature if different from -20 to +40°C, unit serial number, in addition to the classification of Ex protection.



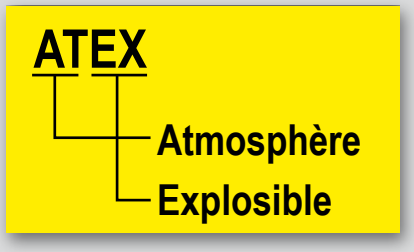
Correct installation

For the installation of electrical systems in areas with explosive gas atmospheres of group II, rule IEC 60 079-14 (EN 60079-14) will apply.

Electric circuits of protection types d, e, q, o, m, p
Installation in the panel is identical to „standard“ installation, however the procedures for connecting Ex equipment must be followed. This refers, for example to voltage, current, fuses and motor protection equipment, etc. The requirements for specific products must be taken from their corresponding test certificates, standards and prescriptions as well as from the guidebook. It is only permitted to work on electric circuits within the Ex-area (for example when connecting to Ex-e terminal box if the voltage has been switched off). An Ex-e terminal box should only be opened after the voltage has been switched off.

Electric circuits of protection type „i“ (intrinsically safe)
For the planning and operation of switchgears and control systems installed in the safe area, but which contain circuits leading into the Ex-area, certain requirements should be considered. This applies especially to intrinsically safe circuits. Intrinsically safe circuits and non-intrinsically safe circuits should be kept separate. Minimum distances (distances) between bare connections must be observed, the cables must not produce any inadmissible external inductance or capacitance. The maximum admissible electrical limits of Ex-i equipment must be observed at all times. Intrinsically safe and non-intrinsically safe electrical circuits should not cross, however it is allowed between two intrinsically safe circuits. Intrinsically safe circuits must be clearly marked. Intrinsically safe circuits are marked by a „light blue“ color. This color is recommended for all intrinsically safe circuits to prevent confusion and/or linking up to a non-intrinsically safe circuit. Examples: cabels, cables, cable conduits, dampers, connection boxes, cable connectors,...
A minimum distance of 50 mm should be allowed between intrinsically safe and non-intrinsically safe circuits, and a minimum distance of 6 mm between two different intrinsically safe circuits. During installation the cables of intrinsically safe and non-intrinsically safe circuits should be laid out separately!

Suggestion on how to create a pannel
It is necessary to keep intrinsically safe and non-intrinsically safe equipment separate. It is recommended, in this case, that a sufficient distance be kept, to avoid extra costs in the future.
Large transformers, frequency rectifiers, large relays and other electric equipment that may influence intrinsically safe circuits by inductance or capacitance should be installed at a sufficient distance. As a precaution Ex-i equipment should have a suitable cover to protect it from incorrect handling. The appropriate standards and regulations must be observed.



Information about electrical explosion-proof according ATEX 94/9/EC

Classification and labelling of explosion proof areas

Flammable medium	Hazardous locations Probability of a potential explosive atmosphere occuring	Classification of explosion proof areas	Product classification: Product group	Product category
Gases, vapours, mists	Always, temporarily or often present	Zone 0	II	1G
	Occasionally present	Zone 1	II	2G
	Very seldom or only present for a short period	Zone 2	II	3G
Dusts	Always, temporarily or often present	Zone 20	II	1D
	Occasionally present	Zone 21	II	2D
	Does not occur or only seldom for a short period	Zone 22	II	3D

Official institutes

Country (Example)	code number	Institute Notified Body
Germany	0102	PTB
Germany	0158	EXAM

Example:

CE 0158

Classification of areas, haz. due to flamm. gases, vapours, mists

Explosion group	Examples depending on - explosion group - temperature class					
IIA	Ammonia Methane Ethane Propane	Ethanol Cyclohexene n-Butane	Petrol Diesel fuel Fuel oil n-Hexane	Acetal-dehyde		
IIB	City gas Acrylic nitrile	Ethylene Ethylene oxide	Ethyl glycol Carbon hydrogen	Ethyl ether		
IIC	Hydrogen	Acetylene				Carbon disulphide

Attention: this list is only an extract of possible flammable mediums and does not claim to be complete!

Temperature class	
T1	<450°C
T2	< 300 °C
T3	< 200 °C
T4	< 135 °C
T5	< 100 °C
T6	< 85 °C

Product use depending on temperature class (T1 - T6). The temperature class indicates the max. temperature of the exposed surface of the product. For dust explosion proof, the max. surface temperature is directly shown (e.g. T80°C).

Temperature class

II 2G Ex d ia IIC T6 PTB 04 ATEX 1028 X

II 2D Ex tD A21 IP66 T80 °C

Protection principle	Type of protection	Code	Symbol	To use in zone	CENELEC
Prevents transmission of the explosion outside	**flameproof enclosure**	**Ex d**		1 or 2	EN 60079-1
Prevents high temperatures and sparks	**increased safety**	**Ex e**		1 or 2	EN 60079-7
Low current/voltage supply	**intrinsic safety**	**Ex i Ex iD**		0, 1, 2, * 20, 21, 22	EN 60079-11 EN 61241-11
Positive pressure device	**pressurised apparatus**	**Ex p Ex pD**		1, 2 21, 22	EN 60079-2 EN 61241-4
Encapsulated	**moulding**	**Ex m Ex mD**		0, 1, 2, ** 20, 21, 22	EN 60079-18 EN 61241-18
Parts immersed in oil to isolate from explosive atmosphere	**oil immersion**	**Ex o**		1 or 2	EN 60079-6
Prevents transmission of explosion outside	**powder filling**	**Ex q**		1 or 2	EN 60079-5
As above, but for use in zone 2	**protection "n"**	**Ex n**		2	EN 60079-15
Dust explosion proof	**protection "tD"**	**Ex tD**		20, 21, 22	EN 61241-1

Protection principle – Type of protection – CENELEC regulations – Basic rule EN 60079-0

IP	Protection against solids/dust	Protection against water
8	–	protected against long periods of immersion
7	–	protected against the effects of temporary immersion
6	totally protected against dust	protected against strong jets of water
5	protected against dust - limited ingress	protected against low pressure jets from all directions
4	protected against solids objects > 1 mm	protected against sprays from all directions
3	protected against solids objects > 2,5 mm	protected against direct sprays up to 60° from vertical
2	protected against solids objects > 12,5 mm	protected against direct sprays up to 15° from vertical
1	protected against solids objects > 50 mm	protected against vertical falling drops of water
0	no protection	no protection

Ingress Protection EN 60529

Application	Code
For common use	–
For use under special circumstances	X
This product is an Ex-certified component for use in a complete system.	U

Further information

* **ia** = Zone 0, 1, 2 **ib** = Zone 1, 2 ** **ma** = Zone 0, 1, 2 **mb** = Zone 1, 2

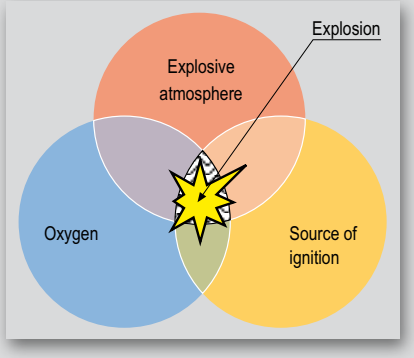
Where and when do I have to take explosion proof into consideration?

Explosion proof means: „Preservation of Life. Health. Basic values“

When can a danger of explosion occur?
A danger of explosion occurs when a flammable medium (gas, vapor, mist or dust) in a dangerous quantity is present.

What creates an explosion?
An explosion may occur when the following 3 components are present at the same time:

- Explosive atmosphere
- Source of ignition
- Air (oxygen)



Typical sources of ignition
Very often the reason for accidents is self-ignition, extraordinary surface temperatures and sparks due to mechanical reasons. But there are also a lot of other sources of ignition, caused by either mechanical and/or electrical equipment.
These are for example:

- Self-ignition
- Extraordinary surface temperatures
- Open flames
- Sparks caused by mechanical reasons
- Static electricity
- Lightning strike
- Ultra-sonic
- Chemical sources of ignition
- Electric sparks
- Electric arcs
- Adiabatic compression
- Adiabatic shock waves
- Electric balancing power

Is your system safe?

We have the following situation NOW or in the FUTURE:

Yes.No (Please check)

- ☐ ☐ Flammable materials are stored.
- ☐ ☐ Flammable materials are used.
- ☐ ☐ Flammable materials are bottled.
- ☐ ☐ Flammable materials are used during the cleaning process.
- ☐ ☐ Flammable materials are used in the production process.
- ☐ ☐ Flammable materials will be produced during the production process.

6 × „No“: Obviously you do not need explosion proof

at least 1 × „YES“:
When planning you have to consider rules, regulations and instructions concerning explosion proof

Example: BetrSichV, ExVO, EX-RL

Remarks:
All information, tables, checklists and further documentation are only for your assistance and do not claim to be complete. In no way do they replace official regulations and rules or even laws by the authorities. We want to point out that it is very important to undertake all measures for an exact classification of the Ex-area.

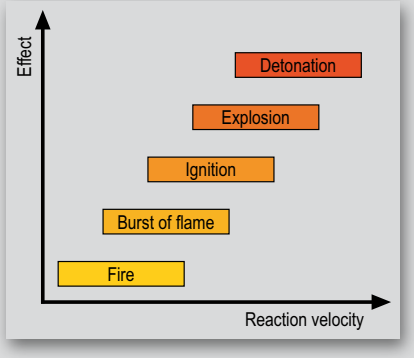
Typical Applications:

- Chemical, pharmaceutical and industrial plants
- Refineries, petrol depots, gas stations
- Paint and solvent shops
- Drying and coating cabinets
- Laboratories in industry and schools
- Water treatment works, power plants
- Compressor stations, gas works
- All kinds of storekeeping and stocks
- All kinds of filling stations
- All kinds of cleaning stations
- Mills, silos, silos for bulk goods
- Offhore and onshore
- Oil and gas pipelines
- Printing works, food industry, …

Schedule:

- Analyse whether you need explosion proof or not
- Ask experts in order to analyse the risk of danger
- Define zones, areas, categories, explosion groups and temperature classes
- Planning according to all necessary rules and regulations
- Choose the best supplier and the right product
- Keep to the installation rules
- Check the labelling of the equipment
- Make sure that the appliance will be put into operation correctly
- Confirm a final inspection by the responsible authority
- Guarantee regular and correct maintenance according to the regulations
- The correct documentation has to be maintained

From fire to detonation
Effect and reaction velocity increase significantly from fire, outburst flame, via ignition and explosion up to detonation. Explosions are more likely with gaseous media and detonations by dust media.



Zones • Explosion groups • Temperature classes

Implementation

Potentially explosive areas should be divided into zones, and the equipment should be divided into groups and categories. The labelling on the identification plate of certified equipment indicates in which zone the explosion proof equipment can be used.

Division into product groups
Groups are divided into group I and group II. Group I consists of mining „underground“ and group II deals with prevention of gas and dust explosion protection for all other applications.

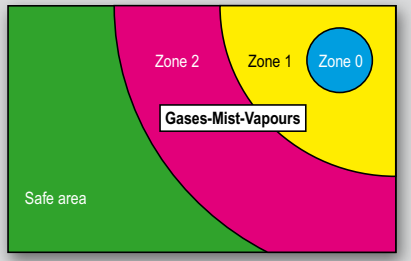
Division into zones
Potentially explosive areas are divided into six zones, according to time-related and local probability, that a potentially explosive atmosphere (p.e.a.) exists.
A distinction is made between combustible gases, mists, vapors and combustible dust. The zones are described in the accompanying table.
Gases, mists and vapors are placed in zones 0, 1 and 2, whereby the requirements for the chosen equipment increase from zone 2 to 0. Equipment in zone 0 must be built in a way „that even if a type of protection fails or if two faults occur, that sufficient explosion protection is guaranteed“. Therefore for example a passive, potential free sensor, installed in zone 0, and connected to an intrinsically safe electric circuit (II2(1)G [EExia] IIC), must display current approval.
Zones 20, 21 und 22 are for dust, whereby the requirements for the chosen equipment increase from zone 22 to 20. Equipment in zone 20 and 21 need special approval.

Division into product groups
Product groups determine, in which zones the equipment should be installed. Once again there are six categories. Categories1G, 2G and 3G are classifications for gas explosion protection (G = Gas); to which equipment with 1G for zone 0, 1 and 2, equipment with 2G for zone 1 und 2 and equipment with 3G for zone 2 are suited. Categories 1D, 2D and 3D are classifications for dust explosion protection (D = Dust); to which equipment with 1D for zone 20, 21 and 22, equipment with 2D for zone 21 and 22 and equipment with 3D for zone 22 are suited.

Classification and labelling of explosion proof areas

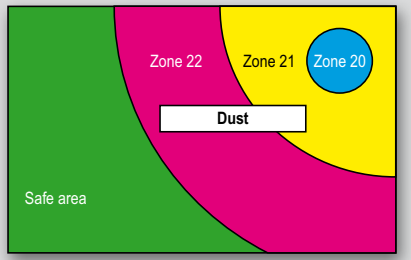
Flammable medium	Hazardous locations Probability of a potential explosive atmosphere occuring	Classification of explosion proof areas	Product classification			
			Product group	Product category		
Gases, vapours, mists	Always, temporarily or often present	Zone 0	II	1G		
	Occasionally present	Zone 1	II		2G	
	Very seldom or only present for a short period	Zone 2	II			3G
Dusts	Always, temporarily or often present	Zone 20	II	1D		
	Occasionally present	Zone 21	II		2D	
	Does not occur or only seldom for a short period	Zone 22	II			3D

Zone 0, 1 and 2



An Example of a typical zone activity would be filling a barrel of petrol in an enclosed area.

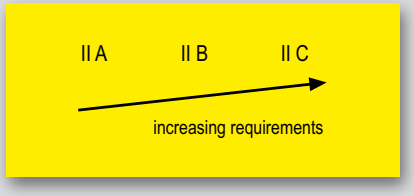
Zone 20, 21 and 22



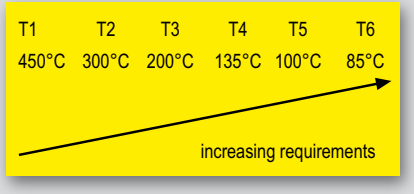
An example of a typical zone activity would be filling a grain silo in an enclosed area.

Explosion groups, temperature classes
The equipment groups and categories determine, in which zones the equipment should be installed, therefore the explosion groups and temperature classes determine, to which mediums inside the zones, the equipment is suited. The type of protection used is not a mark of quality but is instead a constructive solution for selecting equipment for explosion protection.

Division into explosion groups
Explosion proof equipment for gases, mists and vapors is divided into three explosion groups (IIA-IIB-IIC) according to the type of protection being used. The explosion group is a means to measure the ignitability of gases (potentially explosive atmospheres). The equipment requirements increase from II A to II C.



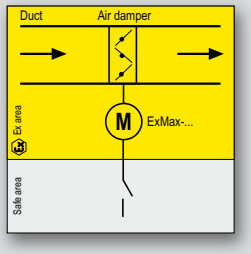
Division into temperature classes
Explosion proof equipment, installed within the Ex area, is divided into 6 temperature classes (T1 to T6). Temperature class is not – as it is often wrongly believed – the operating temperature range of the equipment, but the maximum permissible surface temperature of the equipment, in relation to + 40°C ambient temperature on any surface area, and should not be exceeded at any time. The maximum surface temperature must remain below the ignition temperature of the surrounding medium at all times. The equipment requirements rise from T1 to T6.



Application

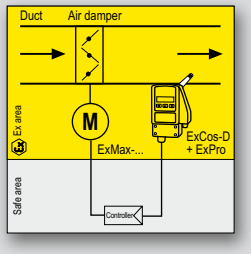
Air safety dampers • Air control dampers • Fire/smoke dampers

Air damper control



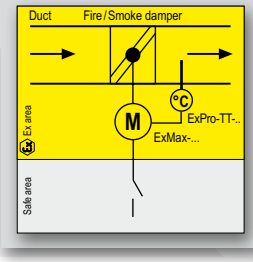
Schischek actuators are approved for direct installation and operation in explosion risk areas, as they are of the highest explosion groups and temperature class and are suitable for all gases, vapours, steam and dust. The electrical connection is made via an explosion proof terminal box (type ExBox-...). Please ensure during installation that all cables are securely fixed and connected in such a way that they are protected from mechanical damage.

Automatic air damper control



The automatic damper control system consists of an actuator and a ExCos-D transducer with ExPro-CT… probe. The combination can be installed directly into the Ex area. The transducer converts the probe signal into an active signal (0...10 VDC or 4...20 mA) for input in a PLC system. The output signal from the controller goes directly to the actuator. Between the sensor and controller there is no need for an Ex i module, or an intrinsically safe (IS) wiring method either. For the actuator and transducer the maximum permissible surface temperature(s) has to be taken into account.

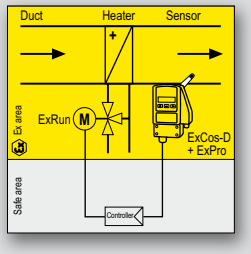
Control of fire/smoke dampers



In applications for fire/smoke dampers, the actuator has to reliably return the damper to its safety position via an external switch/contact. The actuator will return the damper to its safety position by an internal spring. The contact comes from a safety thermal trigger type ExPro-TT-.. which is directly connected to the actuator.

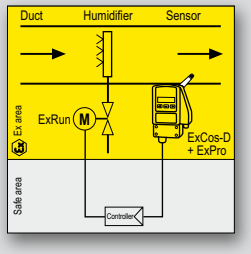
Heating • Cooling • Humidification • Diff.pressure control • VAV

Heating/cooling control



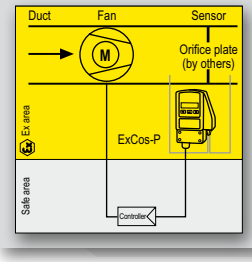
The heating/cooling control system consists of an actuator and a ExCos-D transducer with ExPro-CT… probe. The combination can be installed directly into the Ex area. The transducer converts the probe signal into an active signal (0...10 VDC or 4...20 mA) for input in a PLC system. The output signal from the controller goes directly to the actuator. Between the sensor and controller there is no need for an Ex-i module, or an intrinsically safe (IS) wiring method either. For the actuator and transducer the maximum permissible surface temperature(s) has to be taken into account.

Humidity control



The humidity control system consists of a ExRun valve actuator and an ExCos-D transducer with ExPro-CF… probe. The combination can be installed directly into the Ex area. The transducer converts the probe signal into an active signal (0...10 VDC or 4...20 mA) for input in a PLC system. The output signal from the controller goes directly to the actuator. Between the sensor and controller there is no need for an Ex-i module , or an intrinsically safe (IS) wiring method either. For the actuator and transducer the maximum permissible surface temperature(s) has to be taken into account.

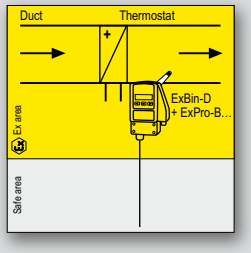
Differencial pressure control/VAV



The DP control system consists of an actuator and a differential pressure ExCos-P transducer. The combination can be installed directly into the Ex area. The transducer converts the differential pressure signal into an active signal (0...10 VDC or 4...20 mA) for input in a PLC system. The output signal from the controller goes directly to the actuator. Between the sensor and controller is no need for an Ex-i module , or an intrinsically safe (IS) wiring method either. The controller, situated in the safe area will, depending on changing circumstances will monitor, control a fan (must be Ex proof) or a modulating damper actuator (also Ex proof) to maintain the required air volume/pressure.

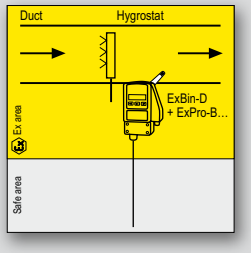
Thermostats • Humidistats • Pressurestats • Filter monitoring

Thermostats



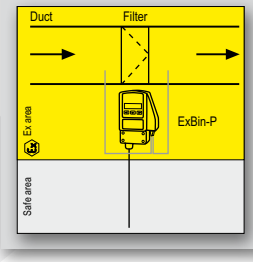
ExBin-D… modules with ExPro-BT… is a sensor probe with a thermostat for use in explosion proof areas. No intrinsic safe electrical circuit and no transducer in the electrical control-panel are necessary. The module should be installed directly into Ex area, depending on demand in zone 1, 2, 21 or 22. The output contact can be used for sequence functions (relays, contacts, direct circuit, …).

Hygrostats



ExBin-D… modules with ExPro-BF… is a sensor probe with a hygrostat for use in explosion proof areas. No intrinsic safe electrical circuit and no transducer in the electrical control-panel are necessary. The module should be installed directly into Ex area, depending on demand in zone 1, 2, 21 or 22. The output contact can be used for sequence functions (relays, contacts, direct circuit, …).

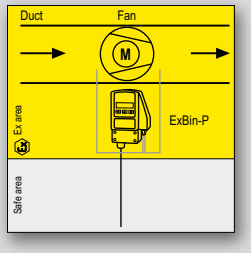
Filter monitoring



ExBin-P… modules are pressostats like Ex-differential pressure switches, e.g. for filter monitoring in explosion proof areas. No intrinsic safe electrical circuit and, no transducer in the electrical control-panel are necessary. The module should be installed directly into Ex area, depending on demand in zone 1, 2, 21 or 22. The output contact can be used for sequence functions (relays, contacts, direct circuit, …).

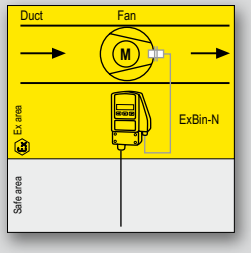
Fan belt monitoring • Frost protection

Drive belt monitoring with differential pressure sensor/air paddle



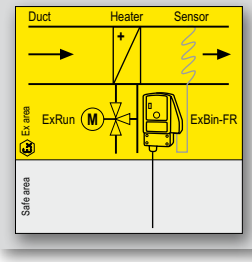
ExBin-P… modules are pressostats like Ex-differential pressure switches, e.g. for fan belt monitoring in explosion proof areas. No intrinsic safe electrical circuit and, no transducer in the electrical control-panel are necessary. The module should be installed directly into Ex area, depending on demand in zone 1, 2, 21 or 22. To indicate fan failure switching modules are delivered with integrated time running relay with delay on start up. The output contact can be used for sequence functions (relays, contacts, direct circuit, …).

Drive belt monitoring with inductive sensor



ExBin-N… modules with connected Namur sensor (inductive proximity switch) are especially for contact-free fan belt monitoring of ventilators, for use in explosion proof areas.
No intrinsic safe electrical circuit and, no transducer in the electrical control-panel are necessary. The module should be installed directly into Ex area, depending on demand in zone 1, 2, 21 or 22. To indicate fan failure switching modules are delivered with integrated time running relay with delay on start up. The output contact can be used for sequence functions (relays, contacts, direct circuit, …).

Frost protection



ExBin-FR… are sensors are for frost protection monitoring with a capillary as measuring element for use in explosion proof areas. No intrinsic safe electrical circuit are, no transducer in the electrical control-panel are necessary. The module should be installed directly into Ex area, depending on demand in zone 1, 2, 21 or 22. The output contact can be used for sequence functions (relays, contacts, direct circuit, …).

SIL „Safety Integrity Level“

Schischek „..Max“ actuators with spring return according SIL

1. Functional Safety
The safety integrity level (SIL) allows to determine the potential risk for people, systems, devices and processes in case of a malfunction. Basis for the specification, design, and operation of safety instrumented systems is IEC standard 61508.

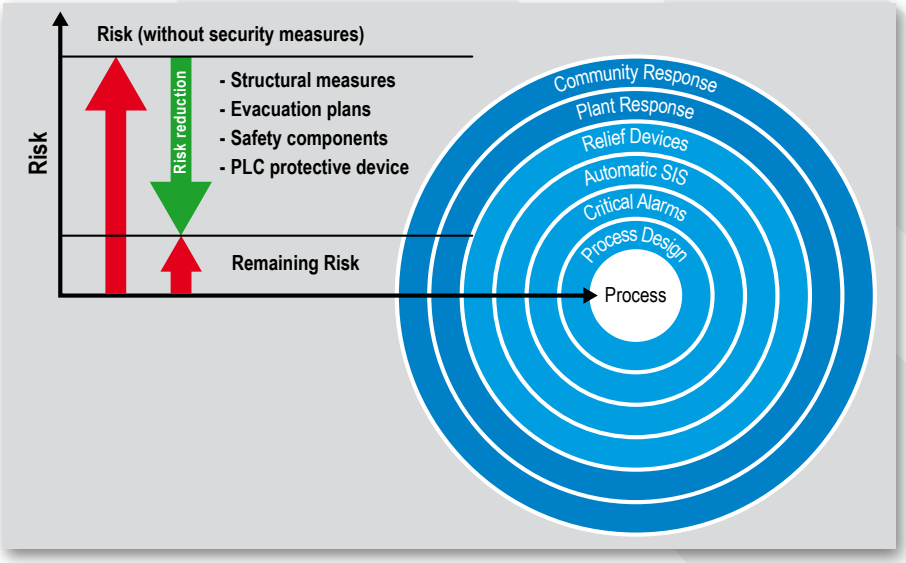
2. Standard
Standard 61508 defines safety depending on the level of integrity and the probability…
61508 encompasses its own risk assessment with which the safety integrity levels for the safety related devices and systems can be determined. The standard knows four levels, SIL 1 to SIL 4, characterizing safety levels for electrical and electronic devices. The SIL level is a measure for the safety function in case of a fault and answers the question: What is the probability of the system still functioning correctly in case of a fault?

3. Specific values

PFD = Probability of failure on demand
PFD_{av} directly describes the probability that the system will malfunction on demand, i.e. when a service request is made or during a continuous temperature measuring. The standard defines different levels of demand and high demand is, as the name implies, when safety related functions are required in a continuous mode of operation. Low demand is where the frequency of demands for operation made on a safety-related system is no greater than one per year. The differences are reflected in the mathematical treatment. High demand looks at failure probability per hour versus low demand at probability of failure per demand.

SIL – PFD_{av} – PFH – modes of operation

Safety Integrity Level (SIL)	Low demand mode operation	High demand mode operation
SIL4	≥ 10^{-5} to < 10^{-4}	≥ 10^{-9} to < 10^{-8}
SIL3	≥ 10^{-4} to < 10^{-3}	≥ 10^{-8} to < 10^{-7}
SIL2	≥ 10^{-3} to < 10^{-2}	≥ 10^{-7} to < 10^{-6}
SIL1	≥ 10^{-2} to < 10^{-1}	≥ 10^{-6} to < 10^{-5}



The goal is to assess the risk and to reduce it by use of suitable measures

MTBF = Mean Time Between Failure
MTBF is applicable only to repairable devices or systems and time between failures assumes that the device has been repaired after a failure. MTBF can be used to estimate failures per time interval. That allows to calculate the probability of a device failure during its life span (for example 10 years for Schischek actuators). MTBF for a given device can be estimated in life cycle tests. Those tests can be conducted under increased stress conditions of a highly accelerated life test, such as radiation, humidity, vibration, high temperatures etc.

Another way to determine MTBF is the reliability prediction, often used in early design stages where devices and systems are not yet available. That allows to evaluate if the target reliability can be achieved but, it requires detailed knowledge of the construction of a device and its components. Failure rates are available for many components and published in manuals. Values given in FIT, which stands for failure in time and is a unite defined as 1 FIT = 10^9 per hour.

MTBF is the reciprocal of the calculated failure rate of the component, which in turn is the sum of the application condition dependent failure rates of the individual components. When used in MTBF calculations FIT is usually used without the unit “failures in 10^9 hours.” If, for example, MTBF for a repairable device is affected by a component for which FIT is known, then MTBF can be calculated based on the following formula:

Formula:

$$\text{MTBF} = \frac{114.000 \text{ years}}{\text{FIT}}$$

Example:
for a FIT of 1140 follows MTBF = 100 years

MTTF = Mean Time To Failure
also used as average mean time to failure MTTFd. The importance of MTTF has been increased by the European Norm EN ISO 13849-1 in connection with machine safety.

MTTF is a statistical quantity based on test results or empirical data and does not constitute a guaranteed life cycle or failure free operating time.

MTTF is based on the reliability function R(t) and is valid under the assumption that that the device in consideration is “as new” after a repair.

SIL „Safety Integrity Level“

Schischek „..Max“ actuators with spring return according SIL

MTTR = Mean Time To Repair
is a measure of how long it takes on average to repair a device after failure and is therefore important in conjuction with system availability.

MTTR also encompasses work and material planning and should be kept as short as possible.

λ = Failure Rate
The failure is the reciprocal of MTBF. (λ = 1 / MTBF)

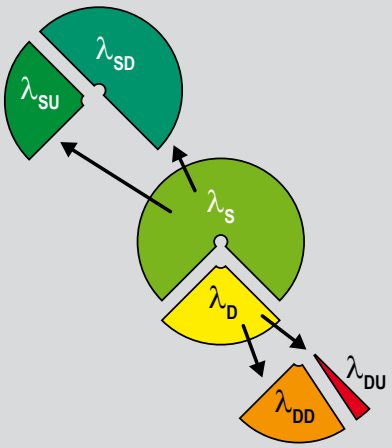
μ = Repair Rate
The repair rate is the reciprocal of MTTR. (λ = 1 / MTTR)

SFF = Safe Failure Fraction
SFF is the proportion of safe errors (λsafe) in relation to dangerous errors (λdangerous). The higher SFF the lower the probabilty of failure.

$\lambda_{total} = \lambda_S + \lambda_D$

$SFF = 1-\lambda_{DU}/\lambda_{total}$

λ_S = safe
λ_{SD} = safe detectable
λ_{SU} = safe undetectable
λ_D = dangerous
λ_{DD} = dangerous detectable
λ_{DU} = dangerous undetectable



HFT = Hardware Failure Tolerance
The hardware failure tolerance HFT together with the safe failure fraction SFF determines the safety integrity level SIL. HFT categorizes the amount of faults a system can endure without failing as a system. The higher HFT the higher is the system availability.

- HFT = 0: no redundancy, a single fault can result in loss of safety.
- HFT = 1: “simple” redundancy, at least two faults are necessary to cause a safety failure.
- HFT = 2: double redundancy, at least 3 faults are necessary to result in a loss of safety.

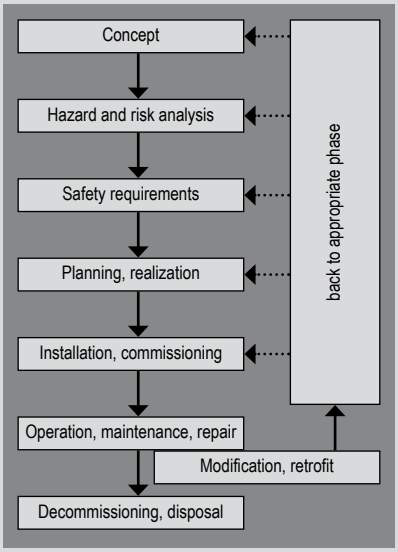
Since the safety function of all individual parts has to be taken into consideration a fully redundant architecture may be necessary depending on the required SIL level.

SFF – HFT – SIL – Type A, Type B

Safe Failure Fraction (SFF)	Hardware Fault Tolerance (Type A – simple subsystem)			Hardware Fault Tolerance (Type B – complex subsystem)		
SIL4	0	1	2	0	1 (0*)	2 (1*)
< 60%	SIL1	SIL2	SIL3	–	SIL1	SIL2
60%... < 90%	SIL2	SIL3	SIL4	SIL1	SIL2	SIL3
90%... < 99%	SIL3	SIL4	SIL4	SIL2	SIL3	SIL4
≥ 99%	SIL3	SIL4	SIL4	SIL3	SIL4	SIL4

* With proven-in-use demonstration acc. to IEC 61511 (only for SIL < 4)

Safety Lifecycle



Needed documents for certification:

- Product Specification
- Functional Specification
- Safety Requirement Specification
- Development plan
- Verification and Valdiation Plan
- Hardware development documents
- Software development documents
- Construction drawings
- Hardware Verification- and Testplans
- Hardware Test results
- Software Verifications and Testplans
- Software Test results
- Failure Mode and Effects Analysis (FMEA)
- Quantitativ verification of safety
- Technical customer documentation

Certification with highest protection classes

ATEX • IECEx • SIL • IP66 • CSA • UL • GOST • RTN

ATEX...
is a commonly used synonym for the ATEX guidelines of the European Union. The name is derived from the French term ATmosphère EXplosive. The directive encompasses explosion protection guidelines 94/9/EG for devices and 1999/92/EG for operations. ATEX guidelines are devised by the Director General of the EU commission Enterprise and Industry in cooperation with the member states, standardization organizations (CEN, CENELEC) and so called known organizations such as BAM, PTB, or TUEV to name examples from Germany.

Physikalisch-Technische Bundesanstalt PTB

EC-TYPE-EXAMINATION CERTIFICATE

PTB 04 ATEX 1028 X

IECEx...
is an internationally used process to certify electrical equipment used in hazardous locations. The code defines a system to classify locations prone to explosive atmospheres caused by gases, dusts, or fibers for example. The main goal of the International Electrotechnical Commission IEC with the IECEx regulation is to reach global harmonization of codes governing use of electrical apparatus in hazardous locations. IEC promotes mutual acceptance of evaluations and reports among the testing labs and certifying bodies.

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

SIL „Safety Integrity Level"...
considers functional safety determine the potential risk for people, systems, devices and processes in case of a malfunction. Basis for the specification, design, and operation of safety instrumented systems is IEC standard 61508. The goal is to assess the risk and to reduce it by use of suitable measures. The standard knows four levels, SIL 1-SIL 4, characterizing safety levels for electrical, electronic and programmable electronic devices, often referred to as E/E/PE. The SIL level is a measure for the safety function in case of a fault and answers the question:

- What is the probability of the system still functioning correctly in case of a fault?

Certificate

Schischek Produktion technischer Geräte GmbH
Mühlsteig 54 – Gewerbegebiet Süd 5
90579 Langenzenn
Germany

Spring Return Electrical Quarter Turn Actuators

ExMax, RedMax, InMax

Return connected appliance to it's design required position on the demand of a safety function

TÜVRheinland

IP66...
stands for Ingress Protection and denotes the protection of the device against environmental factors, dust and rain for example, as well as protection of living beings against dangers of touching high voltage circuits for example. The first digit categorizes ingress of solid objects, the second ingress of water:

- IP6x = dust proof
- IPx6 = water jet proof (with specifies water pressure etc.)

Umweltsimulation LGA

UNTERSUCHUNGSBERICHT Nr.: E 3.906

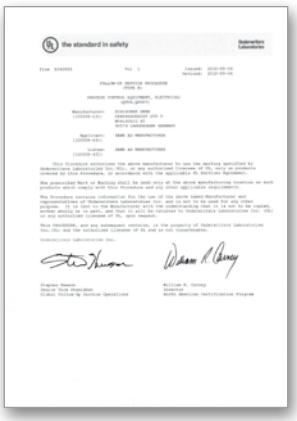
Certification with highest protection classes

ATEX • IECEx • SIL • IP66 • CSA • UL • GOST • RTN

CSA...
is a global provider of testing and certification services.
CSA is also on the OSHA list of nationally recognized testing laboratories, NRTL.

Certificate of Compliance

UL...
is an independent organization testing and certifying product with regards to safety. UL tests and evaluates compliance of products, components, materials, and systems against specific requirements.
As a result the UL mark can be carried as long as the standards are kept to. UL is one of the OSHA endorsed testing labs. OSHA is the Occupational Safety and Health Administration and maintains a list of labs called NRTL, short for nationally recognized testing laboratories.



GOST...
denotes a certification obligatory for goods to be imported to the Russian Federation. Compliance has to be evaluated and approved based on Russian standards. GOST certification is required for examples as follow:

- Food and food packaging
- Electronic devices
- Industrial plants and machinery
- Products used in the oil & gas industry
- Electronic and technical systems

СИСТЕМА СЕРТИФИКАЦИИ ГОСТ Р
ГОСТСТАНДАРТ РОССИИ
СЕРТИФИКАТ СООТВЕТСТВИЯ

RTN...
is short for "RosTekhNadzor". RTN certificates are required in Russia for industrial processes involving hazardous materials and conditions and are required for the equipment used. RTN approves the use of the equipment. RTN approvals are generally necessary for example:

- for all equipment used in the Oil & Gas industry
- all equipment requiring explosion protection

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